CYCLOPEDIA OF HARDY FRUITS

U. P. HEDRICK

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CYCLOPEDIA
OF HARDY FRUITS

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BALDWIN

CYCLOPEDIA OF HARDY FRUITS

BY

U. P. HEDRICK

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New York

THE MACMILLAN COMPANY

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PREFACE

The purpose of this manual is to describe the varieties of hardy fruits grown in North America. A new book describing hardy fruits needs no justification. Downing's *Fruits and Fruit Trees* and Thomas' *American Fruit Culturist,* in their many editions, have served two generations of fruit-growers. Both are worn out tools. Most of the varieties described by these authors are not now found in American orchards or nurseries. Many of the kinds they discuss have never been grown in this country, the descriptions published having come from European fruit-books. On the other hand, none of the varieties of this century is described in Downing or Thomas. Moreover, the descriptions of these old workers are too scant and fragmentary to have great value in modern pomology. A new manual of fruits is needed to take the place of Downing and Thomas, valuable as these books were for their day.

The plan of the book is simple. A brief glance through its pages should suffice to reveal even to the beginner in the study of pomological literature the arrangement of fruits and their varieties, and the presentation of names and synonyms. Clearness and simplicity have been sought, that the reader may with the least trouble obtain a perfect mental picture of the variety described.

The ways in which the author designs to make this manual useful are: (1) To aid in the identification of varieties. (2) To guide in the choice of varieties. (3) To sort the names now in use for varieties of hardy fruits, and assign them to the varieties to which they belong. (4) To state in what regions the varieties described grow best. (5) To tell when and where the varieties originated. (6) By depicting choice products of the orchard, to stimulate the desire to grow better fruits.

The book is written for fruit-growers, nurserymen, students in colleges and high-schools, county agricultural agents, and buyers of fruits. It is designed for those interested in fruits in general, rather than for the specialist in pomology. Specialists will find fuller discussions of nearly all of the varieties described in this manual in the fruit-books published by the New York Agricultural Experiment Station, most of them written under the direction of the author, and from which he has drawn heavily for this volume.

Geneva, New York,
December 15, 1921.

The chief value of a book like this lies in the accuracy of the descriptions and of the determinations of synonyms. Herein the author has had an advantage over the old pomologists, since his connection with a modern experiment station, with a large collection of fruits and a good horticultural library, has given him opportunity to describe first hand and pass impartial judgment on varieties, and to go to original sources for names; whereas, the old writers, lacking these modern facilities, were compelled to copy one from the other.

With great reluctance, the author abandons a key to varieties of the several hardy fruits. Years of patient labor have not enabled him to produce a key that will work. A variety of any fruit behaves so differently in the several great pomological regions of the continent that a key cannot be made that will be usable for a fruit in all regions. A satisfactory key to varieties of apples for New York does not fit this fruit in Virginia, Iowa, California, or Oregon. About the only constant characters of the apple for all regions of the continent are sweetness and sourness. The color of the flesh is the only constant character of the peach. There are few or no constant characters in other fruits as they grow in different regions. To arrange varieties alphabetically is unscientific, disorderly, and makes difficult the identification of fruits, but it is the author's belief that they cannot be satisfactorily arranged otherwise for a text covering more than one pomological region. Keys to varieties of fruits can be of value only when made for particular regions.

In acknowledging obligations, the author needs to name the pomologists of the nineteenth century. Coxe, writing in 1817, was the pioneer, followed by Prince, Kenrick, Manning, Downing, Thomas, Cole, Barry, Hovey, Elliot, Hooper, and Warder, the pageant ending in 1867. These men brought fruit-growing into being in America and nourished it to maturity. They studied fruits in their various seasonal expressions with accuracy and insight, and wrote with the sincere and sympathetic feeling of the best naturalists of their day, thereby putting American pomology on a solid foundation. The author of this manual is not forgetful of their great work, a service to the national welfare little appreciated, but which is to him perennial inspiration.

U. P. Hedrick.

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CYCLOPEDIA
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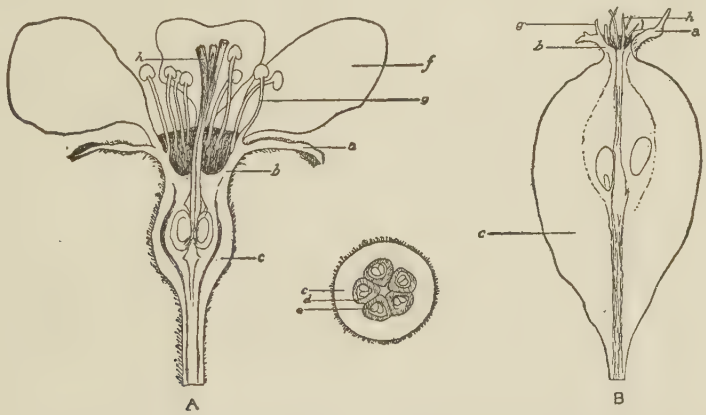
PART I—POME-FRUITS

CHAPTER I

THE STRUCTURAL BOTANY OF POME-FRUITS

Botanists differ in defining a pome. One definition is that the outer fleshy part of the apple, pear or quince, fruits which all agree are typical pomes, is the thickened calyx; a comparatively new definition describes a pome as consisting of two to five carpels, each of which is a drupe-like fruit containing one to many seeds, the several drupes being connected and held together by a fleshy receptacle. The definition most generally accepted is that a pome is a fleshy fruit of which the compound ovary is borne within and connected with the enlarged receptacle.

A discussion of the botanical alliances of this group of plants would be helpful to the study of the structure of pomes. Such a discussion, however, would lead far afield, so that a brief statement must suffice as to the place which pome-fruits hold in botanical classifications of plants. The pome-fruits belong to Rosaceae, a family of plants of which the rose is the type. Three other groups of hardy fruits common in orchards are associated with the pomes in the Rose family. These are: drupe-fruits, to which belong the apricot, cherry, peach, nectarine, and plum; the brambles, a general name for blackberries, dewberries, and raspberries; and strawberries, sometimes called the runner fruits. Among these several groups, pome-fruits lead in importance in the agricultural regions of the world. The pomes seem to have been cultivated longer than any other of the fruits under consideration; hence it may be assumed that they are farthest evolved from the wild state, and accordingly there are more varieties of apples and pears than of other hardy fruits. It is significant that *pomology*, the name accepted for the science and practice of fruit-growing, is derived from *pome*. (Fig. 1.)



1. Flower and fruit of a pome. A, Flower of pome; B, Fruit of pome. *a*, Sepal; *b*, calyx-tube; *c*, receptacle; *d*, carpel; *e*, ovule; *f*, petal; *g*, stamen; *h*, style.

CHARACTERS OF POME-FRUIT PLANTS

The recognition of varieties is usually dependent on characters of the fruits, but the plants are distinct as well as the fruits and may be helpful in identification and classification, and, in the absence of fruit, must be relied on to identify a species or variety. It is

still more important that the cultivator should know whether or not the plant is manageable in the orchard, and, therefore, should have a description of all plant-characters.

Size of tree is a very reliable character to determine varieties of any of the pome-fruits. The Wagener or Rome Beauty apples, or the Winter Nelis pear, are almost dwarfs as compared with other apples and pears. Size varies greatly with environment, it must be remembered, in using this character. The terms *large, small,* and *medium* are commonly used to designate size. Vigor must not be confused with size. Vigor may be defined as internal energy. Small trees may be as vigorous as large ones.

The term "habit of growth," as used by pomologists, has reference to the form of the top. In describing the tops of pome-fruit trees a number of self-explanatory terms are used; as, *upright, spreading, drooping, tall, low, dense, open-topped, vase-form,* and *round-topped.* Many if not most varieties of pome-fruits may be told by the form of the top. One can tell Sutton at a glance by its upright branches; as he can, also, Rhode Island Greening by its wide-spreading branches; or the Winter Nelis pear by its drooping branches. The form of the top may make a variety easy or difficult to manage in the orchard.

Constitutional characters.

Constitution is a rather vague term used by pomologists to indicate the vital power of varieties. It generally refers to hardiness, productiveness, susceptibility to pests and adaptability to climates and soils.

The degree of hardiness is difficult to use in identification but does identify, and is of utmost importance in characterizing the value of a fruit. Baldwin and Rhode Island Greening apples are relatively tender to cold; McIntosh is hardy and Hibernal is very hardy. The Bartlett pear is tender; Seckel more hardy.

Productiveness, age of bearing, regularity of bearing, and certainty of bearing are all well-recognized characters of pome-fruits, helping to set the value of a variety, and all count in classifying, although rather difficult to use for this purpose. Length of life, whether long or short, is another character of constitution that must be noted.

The degree of susceptibility of a variety to fungous diseases or insect pests is a most valuable cultural character and may be used in classifying. Thus, there are great differences in varieties of apples in their resistance to apple-scab, fire-blight, cedar-rust and bitter-rot; or, to codlin-moth, any of the aphids, or San José scale. All pears are more or less susceptible to pear-blight and various fungous diseases, as they are also to psylla, San José scale, and other insects. Varieties of apples and pears are described in this text as immune to one or more of these pests, and others as especially susceptible to them.

All of these constitutional characters are much modified by care and environment. Care and environment, also, greatly modify the adaptability of varieties to special locations, although nothing is more certain than that some varieties are adapted to a greater range of conditions than others. The Baldwin apple and Bartlett pear have as one of their most valuable qualities great adaptability to diverse conditions.

Trunk and branch.

The trunk counts for little in descriptions of varieties because it is usually changed by pruning. The bark may be smooth or shaggy. Color of bark is often a most valuable diagnostic character, especially in young trees. Many if not most varieties of pome-fruits can be told in the nursery by the color of the bark.

The branches offer several distinctive characters, some of which are very reliable. The long slender branches of Rhode Island Greening and Tompkins King apples, and the slender drooping branches of the Winter Nelis pear are examples. The branches of some pears bear spines, and the fruit-spurs borne on branches of all pome-fruits are very characteristic. The branchlets or twigs may be short or slender; long-jointed or short-jointed; straight or zig-zagging; variously colored; some, at certain stages of maturity, are pubescent, others glabrous; the branching angle of branchlets is often characteristic; the epidermis may be smooth or covered with scarf-skin; lastly, the size, shape, color, number, and position of the lenticels on young wood are most important in identifying trees after the leaves have fallen.

Leaf-buds and leaves.

Size, length and shape of leaf-buds help to identify dormant trees. The shape may usually be described as acute, pointed, obtuse, conical or plump. If the bud lies close to the twig, it is said to be appressed; if it stands at a considerable angle, it is free. In examining dormant buds, note should be made as to whether the leaf-scar is conspicuous or inconspicuous.

While leaves vary much in accordance with the condition of the plant which bears them, they offer a number of valuable distinguishing characters. In the study of leaves, those found on water-sprouts or suckers and those borne on slow-growing spurs should not be used, but, rather, those found on free-growing twigs.

The size of the leaf, if given in figures, is a most valuable determinant of varieties of all pome-fruits, as is the shape, if depicted in well-chosen words. Thickness counts for something, as do the color of the upper and lower surfaces and the character and amount of pubescence on the surfaces. The margins offer evidence for identification in the character of the serrations, and in the glands and hairs to be found in an occasional variety. The time of the appearance and the fall of leaves characterizes some varieties. Lastly, some sorts have many leaves and others few. The length, thickness, and color of the petiole and its smoothness or pubescence are sometimes worth noting.

Flower-buds and flowers.

Flower-buds offer the same marks for identification as are mentioned for leaf-buds. They may usually be distinguished from leaf-buds, being larger and less pointed, and, of course, by their contents, if examined under a microscope. Time of opening is a mark of distinction with varieties that bloom very early or very late, but it will be found that most varieties open at approximately the same time.

The flower of the apple gives opportunity to identify through its characteristics almost every variety; the flowers of the pear and quince are of less use, but still are useful. The size, shape, and color of the petals offer the best means of identification in flowers. The length, thickness, amount, and kind of pubescence on the styles may distinguish varieties. The styles of Tolman Sweet are covered and bound together by dense pubescence not to be found in any other variety. The styles of the Howell pear are abnormally short. The calyx-tubes, calyx-lobes, and pedicels differ materially. These structures in the flower, while offering decisive evidence in identification, are seldom used by pomologists, because characters of plant and fruit may be studied during a much longer time and are of greater cultural importance. The stamens, however, afford a more permanent means of classifying than other parts of the flower. In the blooming season, length, diameter, and the pubescence of stamens may be noted, but much more important, taxonomically, is the position of the stamens on the calyx-tube in the mature fruit, these organs, or remnants of them, persisting in the ripened fruits, as will be noted in the discussion of characters of the fruit.

Lastly, some varieties may be identified during the blooming season by the distribution of the blossoms on the tree. The flowers of Rome Beauty, as an example, are borne on the periphery of the tree, giving it an aspect by which one may recognize the variety at once. The flower-clusters of some pome-fruits bear many flowers; others few; in some the flowers are loosely arranged, in others compactly.

FRUIT CHARACTERS OF POMES

If a variety is not noteworthy in the characters for which the fruit is grown—those which appeal to the senses of taste and sight—it stands small chance of being cultivated long or widely. Varieties are generally known, therefore, from the characters of the fruit rather than those of the plant. Hence, especial attention is paid to descriptions of the fruit, some pomologists characterizing almost wholly from the fruit and saying little or nothing of the plant.

Season and use.

Perhaps season is the first character, and certainly it is one of the most important characters to be noted in the ripened fruit. By *season* is meant the period in which a variety is in proper condition for use. Unless otherwise stated, *season* has reference to the period during which fruit is in condition for use in ordinary storage, which of course greatly prolongs the natural season. The terms *summer, fall* and *winter,* sometimes modified by *early* or *late,* give the season with sufficient accuracy. Keeping quality and shipping quality, both dependent on several factors, are usually mentioned in connection with season.

Rather closely connected with season is use, the uses for which a variety is particularly suited being indicated by several terms. A market variety is one suitable for the general market; a local market sort is one which does not stand handling well enough for the general market but is acceptable in local trade. A dessert or table variety is suitable for eating in the uncooked state; culinary, cooking, or kitchen varieties are especially desirable for culinary purposes.

Size and shape.

Among external characters of pome-fruits, size is important, if several typical specimens can be examined, but is often misleading because under the stress of environment abnormal specimens may be produced. Gradations in size are expressed by the terms *large, medium,* and *small,* modified by *very, above,* or *below.* Used in connection with size, *uniform* signifies that the fruits of a variety are generally of about the same size.

Probably no one character of pome-fruits is more important in classification than shape, especially since it may be used with reference to immature as well as mature specimens. In determining the shape of a pome, the fruit should be held opposite the eye perpendicular to the diameter from stem to calyx; or the fruit may be cut longitudinally at its widest diameter. So looked at, an apple may be described as *round, oblate, conical, ovate, oblong, truncate,* or by combinations of these and similar terms. If the fruit then be turned so that the base or apex is opposite the eye, or if a transverse section be made at the widest diameter, it may be determined whether the fruit is regular, that is if the transverse section is circular in outline; elliptical, with its sides compressed; or ribbed, angular, oblique, with sides unequal or symmetrical,—all self-explanatory terms.

The shapes of pears are even more used in classifying that fruit than is the case with apples. Besides the terms used in describing apples, additional descriptive words are necessary by reason of the common division of a pear into two parts—the neck and the body. The neck is the narrow part bearing the stem; the body is the more or less swollen part crowned by the calyx. A pear is pyriform when the curves formed by the body and neck are concave; turbinate, or top-shaped, when the body is nearly round with a short neck. The neck may be long or short, distinct or obscure, obtuse or acute. The body is usually described by the terms used in describing apples.

The terms used in describing shapes of apples and pears are applicable to the quince. Many pomologists describe quinces as either apple-shaped or pear-shaped.

A graphic record should accompany a description of the fruit, to show size and shape. A simple outline drawing serves the purpose.

The stem.

Varying as little as any other character of the apple or pear, the stem is much used in identification. It may be long and slender, as in the Rome Beauty apple or Bosc pear; short and thick as in the Sutton apple and Comice pear; fleshy as in the Peck Pleasant apple and Louise Bonne pear; clubbed when enlarged at the end; and lipped when the flesh forms a protuberance under which the stem is inserted, as in the Pewaukee apple. The stems of pears are often set obliquely, as in Clairgeau; or are crooked or curved, as in Howell. The stems of some pome-fruits have distinguishing colors; those of others are pubescent. In some pears, as Bergamot d'Esperen, there are bud-like projections on the stem. The length of the stem in apples and pears is a reliable diagnostic character only when it is known from what part of the flower-cluster the fruit was developed. For, as a rule, the nearer the flower to the center of the umbel in the apple, and the tip of the raceme in the pear, the shorter the stem of the fruit.

Cavity and basin.

The cavity, the depression in which the stem is set, offers several marks which greatly enhance the value of a description of any of the pomes. It may be acute or obtuse; shallow, medium, or deep; narrow, medium, or broad; smooth or russeted; furrowed, ribbed, angular, or uniform; or it may be lipped as described under stem. The color of the skin within the cavity is sometimes different from that without, and there may be radiating lines, rays, or streaks.

The basin, the depression in which the calyx is set, is as important as the cavity in classifying pomes, and is described by the same terms. The furrows in the basin are sometimes indistinct and are then called wavy. The skin around the calyx-lobes may be wrinkled, plaited, folded or corrugated. Rarely, there are fleshy protuberances about the calyx-lobes, as in the Delicious apple and Siberian crab-apple, called mammiform appendages.

Calyx-lobes.

The withered calyx-lobes persist in some pomes and not in others. They persist in the common apple and are deciduous in *P. baccata;* persist in European pears, deciduous in the edible-fruited Asiatic species; persist in the common quince, deciduous in the Japanese quince. The calyx-lobes may be open, partly open, or closed in varieties of the fruits in which they are persistent. In some varieties of apples the segments are separated at the base; in others, united. The lobes may lie flat on the fruit or may stand erect. When upright, if the tips incline inward, the lobes are said to be *connivent;* if inclined outward, they are *reflexed* or *divergent.* The lobes may be broad or narrow, with tips acute or acuminate.

Characters of the skin.

The skins of pome-fruits offer several most valuable features for classification, color being the most important. Perhaps no character of fruits varies more in accordance with environment than the color, yet the color itself and the way in which it is distributed on the fruit serve to make this character a fairly safe distinguishing mark for most varieties of pome-fruits. The ground-color of apples, pears, and quinces is the green or yellow-green of chlorophyll, usually with an over-color of tints and shades of yellow or red. The over-color may be laid on in stripes, splashes or streaks; or as a blush; it may mottle the surface, or may be a single color, in which case the fruit is said to be self-colored.

The skin may be thick or thin, tough or tender. In a few varieties of apples it is relatively free from the flesh, but with most clings tightly. The surface of the skin may be covered with a delicate white substance called the bloom, McIntosh furnishing a good example of an apple with a bloom. In other varieties the skin is waxy or oily, as in Lowell and Tompkins King apples. This character must not be confused with waxen, which refers to the glossy appearance of the skin of such apples as Winter Banana and Maiden Blush.

Some apples and pears have an unbroken russet surface, as Roxbury Russet apple and the Sheldon pear. Or the surface may be rough because of minute russet dots or netted veins. In many apples the cavity alone is russeted, as in Pumpkin Sweet. If the russet of the cavity is spread out in radiating lines, it is said to be radiating.

In some apples a suture-like line extends toward the apex from the base, Tolman Sweet furnishing an example.

With varieties of all of the pome-fruits, note should be made of the presence and character of pubescence about the calyx. In the quince, the whole surface is covered with woolly pubescence, which must be described.

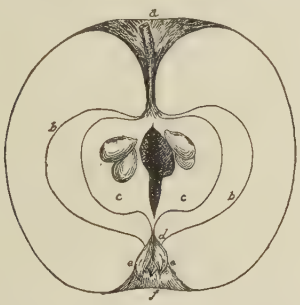
Nearly all apples and pears have few or many dots on the skin, notes on which may enhance the value of a description. These may be obscure or conspicuous, large or small, raised or sunken. If visible under the epidermis, they are said to be *submerged.* When star-like, they are called *stellate.* If surrounded by a halo of lighter color, they are said to be *areolar.* In some varieties of apples, the dots are much elongated.

The roughened outer skin, called *scarf-skin,* gives a distinguishing appearance to a few apples. The scarf-skin runs outward from the base of the apple in lines or stripes on Pumpkin Sweet, Green Newtown, and some other varieties. This scarf-skin gives a dull appearance to some red apples, as Sweet Winesap and Black Gilliflower.

Cutting pomes to show the internal structure.

When varieties cannot be distinguished from external marks, there are several very reliable characters that can be made use of in the internal anatomy of the pome. To study these characters it is necessary to make a longitudinal and a transverse section of the fruit. To make an accurate examination of the internal structure of apple, pear or quince, the sectioning must be done with a keen, thin knife, with a steady hand and a good eye.

In making the longitudinal section, the knife should pass through the center of the calyx, showing the remnants of styles and stamens; through the middle of the core cell, showing the outline of the core cavity; and through the middle of the stem. A true record cannot be obtained unless the organs named are divided with fair accuracy into halves. In making the transverse section, the knife should pass through the widest diameter of the fruit, cutting the core in half. If the core is not in the center of the fruit, trial cuts to locate it must be made that it may be halved exactly.



2. Longitudinal section of an apple showing core characters (× ½). *a*, Cavity; *b*, core-lines; *c*, abaxile open core with broadly elliptical mucronate carpels; *d*, conical calyx-tube; *e*, calyx-lobes; *f*, basin.

The stamens.

After halving the fruit longitudinally, the first organs to be studied are the stamens, the position of which furnishes reliable taxonomic data. Hogg, an eminent British pomologist, devised an analytical key to varieties of apples based on the position of the stamens. Apples may be divided into three groups in accordance with the position of stamens. In one group the stamens are on the outer margin of the calyx-tube and are said to be *marginal;* in the second, they are located about the middle of the tube and are said to be *median;* in the third, they are inserted at the base of the tube and are said to be *basal.*

The calyx-tube and styles.

Passing from the stamens to the calyx-tube, it will be found that the shape of this structure is of some use in separating varieties, although it is exceedingly variable in accordance with the size of the fruit, and is materially altered by abnormalities in the fruit. The base of the styles, in some varieties, develops into fleshy tissue which alters the shape of the calyx-tube. The calyx-tube may be cone-shaped, funnel-shaped, or urn-shaped. When funnel-shaped, the broad upper part is called the *limb;* the narrow lower part, the *cylinder.* In some varieties the remnants of the styles, often more or less fleshy, form a point, called the *pistil-point,* which projects into the calyx-tube. Gano has a well-developed pistil point.

The core.

The position of the core in the fruit is often a valuable means of distinguishing varieties. If close to the stem, the core is said to be *sessile;* if at the center of the pome, it is *median;* when distant from the stem, *distant.* The cell containing seed, called a carpel, is morphologically a modified leaf, which by folding together and by union of its edges forms a closed receptacle. In some varieties the carpels are open; in others, closed. If the tip of the carpel is indented, it is said to be *emarginate;* if long and pointed, *mucronate.* In shape, carpels may be round, cordate, obcordate, elliptical, oblong, elongated, ovate, or obovate. In the cores of most pomes there is a central cavity called the *core-cavity,* sometimes spoken of as the *axial-sac,* which may be either narrow or wide; in some it is lacking. This is a character of much importance and reliability in pears. When the carpels extend quite to the axis of the fruit, they are said to be *axile,* and there is no core cavity; when distant from the axis, they are *abaxile,* and a core cavity is formed. Sometimes the carpel is lined on the inner surface with a white substance, as in Tompkins King, when it is said to be *tufted.* In some pears there are many fine hairs in the core-cavity, in which case the cavity is said to be *tufted.* The characters of the core are shown in Fig. 2. The limits of the core are marked by a line usually very distinct in apples and quinces, which is called the *core-line.* The area enclosed by this line may be large or small and may be variously shaped. In some species of apples, as in *P. coronaria* and *P. ioensis,* the core separates from the flesh along the core-line so that it may be taken out, leaving a well-defined cavity in the apple. The direction which the core-line takes from the intruded woody stem fibres is often a clear mark of distinction. Thus, the line may proceed at right angles from the stem, may incline upward, or incline downward. When the core-line joins the calyx-tube along the sides it is said to be *clasping;* when the two ends of the line meet at the base of the calyx-tube, the expression "core-lines meeting" is used.

Fibrovascular bundles.

Ten primary fibrovascular bundles enter the flesh of pomes from the pedicel and closely follow the core-line which marks the limits of the core. These are plainly seen in transverse sections of apples and quinces as well-marked dots. They are arranged in two cycles. In

the outer cycle, the bundles are opposite the dorsal sutures of the carpels; those of the inner cycle alternate with the carpels. The core-line appears in the transverse section on the inner side of the ten bundles as a beautiful bit of tracery, looping out between the bundles into the pulp. There is much difference in the size of the bundles and in the outline of the core-line, as seen in sections of a pome, and these seem quite distinct in each variety. Accordingly, it is proposed by several workers at home and abroad to classify varieties by means of these structures. To the working pomologist, who finds little difficulty in identifying varieties from characters more easily seen, such attempts seem an unnecessary magnification of fine points.

Seeds.

Seeds are characteristic in all varieties of pome-fruits, and might well be used in classification more generally than is the case. The number is exceedingly variable in all varieties. In apples and pears, the usual number is two in each cell, but often there are three or more, and occasionally seeds are missing; in quinces, there are many in each cell. Seeds vary greatly in different varieties in size, shape and color, and differences in these characters are as constant as are those of any other organs of the fruit. Number, size, shape, and color of seeds should be noted with care in every technical description of a pome. The point of the seed, also, is worth noting; it may be acute, acuminate, or obtuse. Like the carpels, the seeds are often tufted. In quinces, the seeds are arranged in two rows, and the testa abounds in a gum having demulcent and mucilaginous properties.

Flesh.

Most pomes may be identified from the flesh characters without a glance at any other part of fruit or plant. Flavor, odor, and texture of flesh are distinct in almost every variety of apple, pear, or quince, and appeal more strongly to the senses of taste and smell than characters measured by the eye do to the sight. Unfortunately, flavors, odors, and textures are difficult to describe. All characters of the flesh vary greatly in accordance with conditions of growth, soil and climate having a profound influence on texture, flavor, and quality. It is important, also, in describing the flesh to have the fruit at the proper stage of maturity, and as immaturity verges almost imperceptibly into maturity and maturity into decay, each condition affecting the flesh, it is not surprising that differences of opinion may be many in judging the flesh characters of a fruit. In cutting an apple, the color of the flesh is first noted. It may be white, as in McIntosh; tinged with yellow, as in Baldwin; greenish-white, as in Stark; or streaked or tinged with red, as in Wealthy. Apples with red flesh are occasionally found, but no standard varieties have flesh of this color. Pears have the flesh of the same colors as the apple, except that none is quite as white in flesh as McIntosh. The flesh of the quince is yellow or orange, often turning pink or red when cooked. One determines the nature of the texture by cutting the fruit, by pressing with the fingers, and by eating. The texture may be coarse or fine; tender or tough; crisp, breaking, melting, or in the pear almost buttery; dry or juicy. Many varieties of pears are granular or gritty about the core, and sometimes gritty nodules are found in the flesh, but usually as abnormalities.

Flavor and quality.

Apples and pears are readily divided into two classes as to flavor; they are either sweet or sour. Such a division is less apparent in quinces. The qualifying terms *mildly* and *very* are often used with sweet and sour. *Subacid, tart,* and *sprightly* are sometimes most expressive. *Austere* refers to a flavor more or less sour with some *astringency.* Pears and quinces may often be put down as *astringent.* All varieties have a more or less distinct aroma. *Rich* and *refreshing* are words often found in the rather extensive vocabulary necessary to describe the flavors of fruits.

Quality is that combination of texture, flavor, and aroma which makes a fruit pleasant to the palate. Quality is rated by common consent of pomologists in five grades: poor, fair, good, very good, and best. It should be noted that good in this rating signifies a fruit of but medium quality.

The accompanying description blank for the apple sets forth most of the characters students and fruit-growers will use in describing pome-fruits.

DESCRIPTION BLANK FOR THE APPLE

Name .....Orchard..... Row..... No..... Date..... 19....

TREE

Marked characteristics .....
- Large, medium, small
- Vigorous, medium, weak
- Upright, spreading, drooping
- Tall, low, dense
- Open, vase-formed, round-topped
- Slow growing, rapid growing
- Hardy, half-hardy, tender
- Very productive, productive
- Medium productive, unproductive
- Regular bearer, uncertain bearer

SUSCEPTIBILITY to
- Insects .....
- Diseases .....

TRUNK
- Stocky, medium, slender
- Smooth, medium, shaggy

BRANCHES
- Thick, medium, slender
- Smooth, medium
- Shaggy, zigzag
- Red, brown, gray, green

Lenticels
- Numerous, medium, few
- Large, medium, small

BRANCHLETS
- Thick, medium, slender, willowy
- Long, medium, short
- Red, brown, gray
- Green, glossy
- Rough, smooth, zigzag
- Pubescent, glabrous

Internodes
- Long, medium, short

LEAF-BUDS
- Large, medium, small
- Long, medium, short
- Obtuse, conical, pointed, plump
- Appressed or free

Leaf-scars
- Prominent

LEAVES

Length..... Width.....
- Large, medium, small
- Wide, medium, narrow
- Long, medium, short
- Oval, ovate, obovate
- Abruptly pointed, taper-pointed
- Thick, medium, thin
- Light, medium, dark green
- Smooth, rugose

Margin
- Glandular, crenate
- Finely serrate, coarsely serrate

Petiole, length .....
- Long, medium, short
- Thick, medium, slender

FLOWERS

Date of bloom .....
- Early, medium, late
- Large, medium, small
- White, pink
- Fertile or sterile

FRUIT

Marked characteristics .....
- Early, mid-season, late

DATE OF RIPENING .....

LENGTH OF SEASON .....

HANGS WELL OR DROPS .....

KEEPING QUALITY .....

SHIPPING QUALITY .....

SUSCEPTIBILITY to
- Insects .....
- Diseases .....

FRUIT, Cont'd

Length .....
- Large, medium, small
- Uniform, variable
- Roundish, oblate, conical
- Ovate, oblong, truncate
- Oblique, ribbed, irregular
- Symmetrical, sides unequal
- Uniform

STEM
- Long, medium, short
- Thick, medium, slender

CAVITY
- Obtuse, acute, acuminate
- Shallow, medium, deep
- Narrow, medium, broad
- Russeted, smooth
- Symmetrical, furrowed
- Compressed, lipped

CALYX
- Open, closed
- Large, medium, small

Lobes
- Separated at base
- Long, medium, short
- Broad, medium, narrow
- Obtuse, acute, acuminate

BASIN
- Shallow, medium, deep
- Narrow, medium, wide
- Obtuse, abrupt, smooth
- Furrowed, corrugated
- Symmetrical, compressed

SKIN
- Thick, medium, thin
- Tough, medium, tender
- Smooth, rough
- Russet, waxen
- Glossy, dull, bloom

COLOR .....
.....
.....
.....

DOTS
- Numerous, medium, few
- Large, medium, small
- Conspicuous, obscure
- Gray, russet
- Submerged, areolar

FLESH
- White, yellow, red
- Firm, coarse, medium, fine
- Crisp, tender, tough
- Dry, juicy, sweet, subacid
- Sour, aromatic, sprightly

Quality
- Best, very good, good
- Fair, poor, very poor

CORE
- Large, medium, small
- Open, closed
- Axile, abaxile

CORE-LINES
- Clasping, meeting

CALYX-TUBE
- Long, medium, narrow
- Wide, medium, narrow
- Funnel-shaped, conical, urn-shaped

SEED
- Large, medium, small
- Wide, medium, narrow
- Long, medium, short
- Flat, plump, obtuse
- Acute, acuminate, tufted

USE—Dessert, kitchen, market, home

TYPE OF .....

DESIRABILITY .....

REMARKS .....
.....

CHAPTER II

SPECIES OF POME-FRUITS

There are about ninety genera in the Rose family, of which ten or twelve bear pome-fruits. Of the pome-bearing genera, but two contain cultivated species of prime importance in fruit-growing: namely, Pyr s, to which belong apples and pears; and Cydonia, the quince. Three other genera are of lesser importance: Mespilus, the medlar; Chænomeles, the Japanese quince; and Amelanchier, the Juneberry. The fruits of Crataegus, the hawthorns or thorn-apples, allied to medlars in the structure of the fruit, are edible, and several species offer possibilities for domestication, but none is cultivated in North America.

THE GENUS PYRUS

Authorities differ as to what groups of plants should be included in Pyrus. Most of the older botanists placed in the genus the apple, pear, crab-apple, quince, medlar, sorbus, and chokeberry. Some botanists still include all of these fruits, but the modern tendency is to segregate the groups in distinct genera somewhat in accordance with the common names, as the differences which give distinctions sufficient for a common name suffice also for a botanical division. The pear and apple, however, are generally kept together in Pyrus; but few botanists consider the differences in the two fruits sufficiently marked to justify putting them further apart than in two sections of one genus. The distinguishing characters of Pyrus are:

Woody plants, trees or shrubs, with smooth or scaly bark. Leaves simple, or sometimes lobed, alternate, usually serrate, deciduous with deciduous stipules which are free from the petiole. Flowers perfect, regular, borne in compound terminal cymes; torus urn-shaped, adnate to the ovary and inclosing it with thick succulent flesh at maturity; calyx-lobes 5, acuminate and reflexed, persistent in some and deciduous in other species; petals 5, white, pink or red, inserted on the thickened border of the disk; stamens 15-20, in three rows; styles 2-5 free or united below; carpels 2-5, inferior, crowned by the styles, usually 2-seeded. Fruit an ovoid or pyriform pome; seeds 2 in each cell, brown or brownish, lustrous, mucilaginous on the outer surface.

Pyrus contains fifty to sixty species widely scattered throughout the north temperate zone, the largest number in south-central and eastern Asia. In North America, Pyrus is represented by five species, while eight or nine species inhabit Europe. Study of the species makes plain that there are many natural varieties. The two sections of Pyrus, given the rank of genera by some authors, are distinguished as follows:

1. Apples (Malus). Flowers pink, rose-color, red or sometimes white, borne in fascicles or subumbellate clusters on short spurs or lateral branchlets; ovary 3-5-celled; styles more or less united at the base. Fruit more or less globular with a distinct depression at both ends, the flesh without grit cells, rounded at the base. The species in this section number from 30-40, of which not more than a half dozen are domesticated.

2. Pears (Pyrus). Flowers white, few, borne in corymbs on short spurs or lateral branchlets; ovary 5-celled; styles usually free. Fruit usually pyriform, sometimes subglobose, usually conical at the base, the flesh usually bearing grit-cells when ripened on the tree. The species number from 15-20 of which but two are truly domesticated, but several others give promise of value for stocks and possibly for their fruits.

THE APPLE

Of the thirty and more species of apples and crab-apples, but two are prominent pomological subjects, as all of the others remain wild or are cultivated in a small way or as ornamentals. Among the ornamental species, however, are several bearing edible fruits, which, though of small value now for the orchard, may through selection or hybridization play an important part in the pomology of the future. But for the present, fruit-growers are concerned with only *P. Malus,* from which comes the common apple, and *P. baccata,* parent of most cultivated crab-apples. Cultivated apples and crab-apples are easily distinguished in standard varieties by size, shape, flesh, and flavor, to name the characters in which differences are most apparent, but in outlying varieties the two fruits merge into each other so that clear botanical separation rests on a difference in one structure, the calyx. In the common apple the calyx persists on the ripened fruit; in the true crab-apple, it falls from ripe fruits.

1. *Pyrus Malus,* Linn. Apple. Plant a large bush or a tree attaining a height of 60-70 feet with a trunk 1-2 feet in diameter which divides into stout spreading branches forming a round open head; bark separating into large, thick, ashy-brown persistent scales; branchlets and twigs glabrous or slightly pubescent, usually bright red-brown and dotted with scattered, conspicuous lenticels. Leaves oval, ovate or orbicular-ovate, usually pointed at the apex, rounded or truncate at the base, with serrate margins, dull in color, soft in texture, borne on stout petioles. Flowers large, white, pink or red, borne in close terminal cymose clusters on short pedicels; appearing with the leaves; calyx-lobes 5, acuminate; petals 5, inserted, remotely contracted into narrow claws, usually pink. Fruit exceedingly variable in size, shape color, flavor and time of ripening, with a cavity about the stem, the calyx persistent and set in a well-marked basin; flesh thick, succulent and homogeneous. Seeds brownish, glossy, mucilaginous, usually two in each of the 5 carpels forming the core.

Between four and five thousand named pomological varieties belong to this species, a

species, however, which some authorities prefer to divide into two or more specific groups. It is probable that cultivated apples have come from two distinct species, possibly three, but these have been so fused by hybridization that it is now impossible to separate cultivated varieties into species. The best that can be done is to divide the species into several botanical varieties to which the pomological varieties may be referred, but even this cannot be done with the precision that might be wished. Of the many botanical varieties described by various authors, but three are delimited with sufficient exactness to make them useful to the pomological student. These are:

Var. *sylvestris,* Linn. Characterized by glabrous shoots and leaves whereas those in the type species are pubescent; the calyx-lobes are glabrous outside but pubescent within. The habitat of the variety is West and Central Europe. The distinction between this variety and the type species would be hardly worth making, were it not that some European botanists give it the rank of a species and refer several pomological varieties to it.

Var. *pumila,* Henry. To this botanical variety, described as a species by some authors, most of the cultivated apples are now referred. The trees are large or small, sometimes bush-like, with the young branches, pedicels, calyx-tube, both surfaces of the calyx-lobes and the under surface of the leaves prominently tomentose. The Paradise and Doucin apples, used as dwarfing stocks, are probably dwarf forms of Var. *pumila.* This botanical variety is native to southeastern Europe and western Asia, although found wild as an escape wherever the apple is cultivated.

Var. *astracanica,* Loud. It is probable that several pomological varieties belong to this botanical variety, which is characterized by large, coarsely serrate or double serrate leaves, tomentose beneath, and by the long pedicels; it is a native of Asia.

In the descriptions of the species and its varieties, statements of habitat were made; these need to be amplified. *P. Malus* has been known as a wild plant in temperate Europe and Asia throughout historic times, but unquestionably its fruits were used long before history began, and, no doubt also, the plants were distributed by the prehistoric dwellers in the two continents. Students of the origin of cultivated plants now believe the species to be indigenous in the northwestern Himalayas, where there are vast forests of wild apples ascending the mountains to a height of nine to ten thousand feet in regions to which man could hardly have introduced the plant.

The apple has been cultivated from remote times in India, Cashmere, and northern China. Carbonized apples are found in the ancient lake habitations of Switzerland, showing that they must have been known in Europe by prehistoric peoples. The apple is mentioned by the earliest writers on agriculture in China, India, Greece, Italy, France, Germany, and England. It was introduced by the first colonists in all temperate parts of the New World. It is now the most valuable fruit-plant of the temperate regions of the world, and by selection and hybridization several thousand varieties have been obtained. The apple is cultivated in all agricultural regions of the United States excepting in subtropical parts of the Gulf states and California.

CRAB-APPLES

There seems to be little question that the crab-apples of most common cultivation, represented by such varieties as Martha, Hyslop, and Transcendent, are hybrids between two species, *P. baccata* and *P. Malus,* though these hybrids are often put in a separate species, *P. prunifolia.* The Siberian crabs, of which several named varieties are cultivated, undoubtedly belong to a distinct species now to be described.

2. *Pyrus baccata,* Linn. Siberian Crab. Plant a small round-headed tree attaining a height of 30-40 feet, with a trunk 10-12 inches in diameter, which divides into many rather slender branches forming a compact head; vigorous, hardy and productive; wood hard and tough, bark much less rough and tree smoother in all of its parts than in the common apple. Leaves ovate, ovate-lanceolate or ovate-acuminate, thin, glabrous, bright green; petioles slender; margins finely and evenly serrate. Flowers large, white, very fragrant, handsome; appearing with the leaves; pedicels very slender, greenish; style usually longer than the stamens, glabrous or lightly pubescent; calyx-lobes long, narrow acuminate; calyx falling away before maturity. Fruit from ½-1 inch in diameter, yellow or red; borne on long, hard slender stems; basin shallow or none, often wrinkled or having mammiform protuberances; flesh yellow, very firm, subacid, astringent, translucent. Seeds small, short, wide, obtuse, dark brown.

There are several botanical forms of *P. baccata,* but to which of these the cultivated crab-apples belong is a mooted question. No doubt there are a number of natural hybrids, as there certainly are of artificial ones. Hybrid and pure-bred crab-apples, cultivated for their fruits, number two score or more, and probably a much greater number of named varieties, the world over, are grown as named ornamentals.

The crab-apple probably came originally from Siberia, northern China, and Manchuria, but has been cultivated for its fruit and flowers in China and Japan from time immemorial. The Chinese and Japanese have developed many forms differing in plant, fruit, and flower, more particularly in the flowers, these being of many colors, various sizes, and in all degrees of doubling. The Siberian crab-apple is the hardiest of the tree-fruits, grows with great rapidity, thrives in many soils, and bears year after year with increasing abundance.

This species was early introduced into Europe, although little grown until the last century for its fruit. While it may have come earlier as an ornamental, it seems not to be mentioned as a fruit-tree in America until toward the close of the eighteenth century, and since nurserymen did not list crab-apples until toward the middle of the nineteenth century, this fruit must be looked on as comparatively a newcomer.

But few of the cultivated crabs of American orchards are pure-bred to the species, most of them being hybrids with *P. Malus.* These hybrid crabs are most valuable additions to the apple-flora of the whole country, and, because of great hardiness, promise much for cold regions. The species does not thrive as well as might be wished in southern apple re-

gions, where its usefulness is also much curtailed by its susceptibility to pear-blight. Crab-apple trees are used in cold climates as stocks upon which to graft the common apple, for which purpose they are in most respects very desirable.

Some twenty or more oriental flowering crab-apples are listed in the botanies, several of which produce edible fruit, and two of which, *P. prunifolia,* Willd. and *P. Sieboldii,* Regel, have been more or less cultivated for their fruits and used as stocks for the common apple in China and Japan. Some of these Asiatic crab-apples are promising, also, for hybridization with the common apple and the Siberian crab.

Five types of native crab-apples grow in North America. None of these has sufficient merit to recommend it to pomologists in regions where the common apple grows, but one, the Soulard crab, *P. Soulardii,* Bailey, probably a natural hybrid between *P. Malus* and *P. ioensis* is grown in the upper Mississippi Valley where only trees of great hardiness withstand the cold. A typical variety of this species is described as the Soulard crab by botanists. There is some promise of further amalgamation of the common apple and the native crab-apple to secure greater hardiness of tree and longer keeping qualities in the fruit.

THE PEAR

The innumerable varieties of pears, more than 4000, almost all come from a single species, *P. communis.* A second species, *P. serotina,* the Chinese Sand pear, furnishes perhaps a score of named sorts with showy fruits which keep well, but are scarcely edible uncooked and of very indifferent quality in culinary preparations. This species, however, has added much to the pear flora of the world; for, when hybridized with the common pear, a plant is produced of remarkable vigor, clean in growth, productive, hardy, and almost immune to the dreaded pear-blight, which yields a fruit suitable for culinary purposes and edible out of hand, if properly ripened. The well-known Kieffer is typical of these hybrids. A third species, *P. nivalis,* the Snow pear, is grown sparingly in parts of Europe for the making of pear cider, but is not of sufficient importance to warrant discussion in a pomological text.

3. *Pyrus communis,* Linn. Common Pear. A vigorous, upright tree attaining a height of 80 feet and a diameter of 4 feet, usually with an oblong or pyramidal and rather compact top; bark on old trees rough with rather large persistent scales. Leaves 2-4 inches long, 1-2 inches wide, oblong-ovate, thin, hard and veiny; upper surface dark green, glabrous; lower surface light green, glabrous; apex acuminate; margin, crenate-serrate or entire, never setose-serrate; petiole 1 to 2 inches long, becoming glabrous. Flowers 1-2 inches across, white, appearing with the leaves, borne in 4-12 umbel-like clusters on slender pedicels; calyx persistent or rarely deciduous; stamens 15-20. Fruit exceedingly variable under cultivation, usually pyriform, sometimes round-conic, turbinate or occasionally round-oblate; green, yellow, red or russet, or combinations of these colors; flesh of fruits ripening on the tree with few or many grit-cells. Seeds 1-3 in a cell, sometimes abortive or wanting, large, brown or brownish, often tufted at the tips.

Botanists describe several botanical varieties, and some would separate from the species a number of garden forms. In the present state of botanical knowledge of the species, however, the pomologist may best classify pomological varieties under the type species.

Pyrus communis now grows naturally in all but the coldest and warmest parts of Europe and Asia. It probably came originally from the Caucasian countries and northern Persia, where, in elevated regions, there are now forests of wild pears; or, possibly, the original center of distribution was in Cashmere and the northwestern Himalayas where there are also pear forests. The tree grows spontaneously as an escape from orchards in nearly all regions where the pear is generally cultivated, but sparingly in North America, because kept down by pear-blight.

The common pear has been cultivated from time immemorial. The ancient Greeks had several varieties; Pliny, the Roman naturalist, describes forty-one varieties. The pear is mentioned in France, Germany and Great Britain almost with the first written records of agriculture, and it came to America with the earliest permanent settlers in the northern states. The French brought the pear to Canada and Michigan, and pear-trees said to be two hundred years old are yet standing about mission sites of the French along the St. Lawrence and the Great Lakes to Detroit, Michigan. The pear is now grown in the temperate regions of the whole civilized world, not so commonly planted as the apple only because less easily managed in the orchard, less adaptable to soils and climates, and more susceptible to pests, especially the pear-blight, which takes prodigious toll from this fruit in the pear-regions of the New World.

In North America, pears thrive particularly well only in the states north of Maryland and west to Wisconsin and in the Pacific states. The climate of the southern states is uncongenial to this fruit, being too hot, while that of the Mississippi Valley and Great Plains is too hot in the summer and too cold in the winter. Blight, also, is more virulent in these regions than in those first named, and makes pear-culture precarious even where climate favors. California and New York are the leading pear-growing states, in both of which regions the pear industry is handicapped by blight.

Pear-growing began in America as an avocation for men of means, leisure, and taste. Its period of greatest activity began early in the nineteenth century and passed before the close of the century, during most of which time the pear was the center of interest in American fruit circles. In the first half of the last century many new varieties of pears were introduced from Europe, and a considerable number originated on this side of the Atlantic. In 1859, T. W. Field, in his *Pear Culture,* gave a

list of 854 pears, of which 686 originated in Europe and 168 in America. The great American pomologists of the nineteenth century—Manning, the Downings, Wilder, Berckmans, Hovey, Barry, and Thomas—were more interested in the pear than in any other fruit.

For many years past, however, the pear, in comparison with the apple, peach, plum, or cherry, has been losing in popularity. There are now few good collections in the country; nurserymen list fewer and fewer varieties; the pear is now less and less used as a dessert fruit, the product being largely used in canning. Pear-culture is failing in America for the reasons that the pear is not well adapted to the American climate; that cultural and commercial conditions make it more difficult to grow than other fruits; and that the formidable disease, blight, remains unchecked by any of the remedies now in use.

Owing to the decline in pear-growing, many of the varieties described in this text cannot now be purchased from nurserymen. All have been cultivated on this continent, however, and many old trees of all varieties still exist. Some, it is to be hoped, will be reintroduced for home orchards, if not for commercial plantations.

4. *Pyrus serotina,* Rehd. Tree vigorous, upright, attaining a height of 20-50 feet, the branchlets becoming glabrous. Leaves ovate-oblong, sometimes ovate, 3-5 inches long, rounded at the base, long acuminate, sharply setose-serrate; lower surface cobwebby but becoming glabrous. Flowers white, borne in 6-9-flowered umbellate-racemose clusters; calyx-lobes long-acuminate, glandulose denticulate; petals oval, short-clawed; stamens about 20; styles 4 or 5, glabrous. Fruit subglobose, russet-brown; stalk slender; calyx deciduous.

Pomologists are interested in the type species, which comes from central and western China, only as a possible source of blight-resistant stocks for varieties of the common pear. Stocks from the species were introduced some years ago on the Pacific slope, but have proved unsatisfactory because difficult to bud, very susceptible to leaf-blight, and not immune to pear-blight. Rehder, an authority on Pyrus, gives two botanical varieties, one of which is most important to pomologists, having given, as a hybrid with the common pear, a new and very distinct type of pear. This variety is described as follows:

Var. *culta,* Rehd. Sand Pear. Japanese Pear. Chinese Pear. Tree strong and rapid in growth, with strong thick shoots. Leaves very large, often 6 inches long and 3-4 inches broad, broadly ovate and long-pointed, very dark green; margins setose-serrate, the teeth very sharp, almost bristle-like. Flowers very large, appearing somewhat in advance of the foliage. Fruit apple-shaped or pyriform, more or less rough, with a well-marked cavity about the stem; calyx usually deciduous; flesh tough, gritty and poor in flavor.

The sand pear differs from the type in its larger and differently shaped fruits and much larger, greener leaves. It comes from Japan, where it must have been early introduced from China, and where it is now the most common fruit-tree with the exception of the persimmon. There are several pomological varieties in Japan, although they differ less from each other than varieties of the European pear. The fruits are little liked by those who have the common pear, although they are attractive in appearance, long keepers, and not unpalatable in some culinary preparations. Several Japanese pears have been introduced into America, and their apple-like fruits are not uncommon, being readily distinguished from apples by their deciduous calyces, rough skins, long stems, gritty flesh, and potato-like flavor.

These Japanese pears hybridize freely with the common pear, and several valuable hybrids are now widely and commonly grown in North America, Kieffer, Le Conte, and Garber, in the order named, being the best known. These hybrids are much stronger in growth, more blight-resistant, more productive, and more rapid in growth than the common pear; the fruits are more pyriform and of much better flavor than those of the oriental parent; the calyx in the hybrid is sometimes persistent and sometimes deciduous. They do not make good stocks and intergraft but poorly with the common pear. Of all pear-trees, these are handsomest in growth, making excellent ornamental plants.

Several other oriental pears are being tested in the United States as stocks for named varieties of the common pear. Seedlings of the common pear have been used in the past as stocks, but these are susceptible to blight, lack in vigor, and the seedlings are not uniform. Search is being made for an oriental pear that does not have these defects and those of European stocks. Some of the species introduced from China for stocks are cultivated in their native country for their fruits, and it may be expected that hybrids between these and the common pear will give new types of this fruit.

THE QUINCE

The common quince belongs to the genus Cydonia, which differs from Pyrus chiefly in the fruits. Thus, the pomes of Cydonia are harder than those of Pyrus; the quince has a woolly surface while that of the apple and pear is smooth; the sepals at the apex of the quince are more leaf-like than those of the apple and pear; the five carpels of the quince contain many seeds, those of species of Pyrus but few; the testa of quince seeds abounds in a gum having mucilaginous and demulcent properties, while there is little or no gum in seeds of the apple and pear; the stem of the quince is so short as to appear to be wanting, while the stem of the apple and pear is distinct and often long. Cydonia contains only the species now to be described.

Cydonia oblonga, Mill. Common Quince. Small trees or shrubs 15-20 feet in height, with slender unarmed branches. Leaves alternate, oblong-oval, entire, pubescent beneath, petioled, stipulate, 2-4 inches long. Flowers white or tinged with pink, large, 2 inches in diameter, showy, terminal on short leafy branchlets; petals 5; stamens numerous; styles 5, free; ovary with 5 cells each containing many seeds. Fruit large, round or pear-shaped, yellow, woolly, with hard yellow flesh which becomes pink after cooking.

The Japanese quince, now put in the genus Chænomeles, was long included in Cydonia. It is easily distinguished by the serrate or crenate papery leaves and styles united at the base. The species has been divided into several botanical varieties, but only the type is of interest to pomologists.

The quince is of but secondary importance in fruit-growing, since it is only sparingly used for culinary purposes. The fruit deserves, however, much more attention than is given it in domestic economy, for it is second to no other for marmalades, jellies, and conserves of all kinds, and is much used for flavoring preparations of apples and pears. There are but few varieties and there seems to be little or no interest in increasing the number, although the quince offers great possibilities in hybridization within the species and with the Japanese quince, while interesting hybrids between the quince and the pear are recorded. Quince stocks are much used whereon to graft the pear, to dwarf the tree and increase the size of the fruit and hasten its bearing.

The quince is a native of the Mediterranean and Caucasus regions, and in ancient times grew abundantly in Crete, deriving from Cydon in that country the name Cydonia. From ancient Greece, it was taken to Rome before the Christian era, for the writers of the first century mention it as if it were a common fruit. The Romans knew the quince as the *cotonea,* a name to be found in old English as well as in Latin. Spreading from Italy, it was soon cultivated, as agriculture advanced step by step, throughout the mild climates of Europe. In 812, its culture was enjoined by Charlemagne in France under the name *coing.* Chaucer speaks of the quince in the latter part of the fourteenth century in England, calling it *coine* from the French. Early Spanish, English, French, and Dutch settlers brought the quince to America.

THE JAPANESE QUINCE

Four species of Chænomeles are grown for their handsome flowers, and one, *C. lagenaria,* is of some value also for its fruit and offers a good field for the plant-breeder. Through hybridization and selection, it is possible that other species of the genus might be made to yield fruits of value.

Chœnomeles lagenaria, Koid. Japanese Quince. Shrub 3-6 feet high, with spreading, spiny branches. Leaves sub-persistent or deciduous, alternate, oblong-ovate, glossy above, papery, 1½-3 inches long. Flowers in clusters of 2-6, red or reddish, 1½-2 inches across; calyx-lobes entire or serrate; petals 5; stamens numerous; styles 5, united at the base. Fruit 5-celled, each cell with many seeds; globular or ovoid; yellowish-green; stem lacking.

There are many ornamental forms, most of which bear quinces esteemed for jellies, conserves, and other culinary purposes. The dark, green fruits are very hard, but contain a rich, aromatic, lemon-like juice which makes a jelly of very pleasing flavor. The fruits are further characterized by a strong, distinctive odor, to most people very pleasant, which it imparts to other fruits when cooked with them. The species is a native of China and Japan, but has long been cultivated in Europe and America.

THE JUNEBERRY

Under the names juneberry, shad-bush, service-berry, sugar-pear, and grape-pear, or their equivalents in other languages, the fruits of some twenty-five or thirty species of Amelanchier are used for food in all parts of the North Temperate Zone. While very distinct in aspect of tree and fruit, Amelanchier and Pyrus have few structural differences, the two genera being separated chiefly by reason of the fact that the compound ovary in Amelanchier has partial divisions which are

3. Juneberry. (×½)

lacking in the ovary of Pyrus. The species are so closely related, with numerous spontaneous hybrids,—from which, indeed, they are hardly to be distinguished—that it serves the uses of pomologists to characterize the genus alone, without giving detailed descriptions of the several species which have pomological possibilities. (Fig. 3.)

Amelanchier. Shrubs or small trees, unarmed. Leaves simple, alternate, petioled, serrate. Flowers white, racemose or rarely solitary; calyx 5-cleft, persistent, the tube campanulate and adnate to the ovary; petals 5, obovate, oblong or rarely linear; stamens numerous, short; styles 5, united below; ovary inferior, 5-celled, each cell with two ovules; cells with a projection growing from the back forming a false partition. Fruit an edible berry-like pome with a cavity at the top; sweet and juicy; ripening in early summer.

The species of interest to fruit-growers are all natives of temperate North America. The product of one or another of them plays an important part in the diet of North American Indians, who make use of the berries both fresh and dried. So, also, juneberries have been a source of food supply to explorers, prospectors, and pioneers, who testify to their value as pleasing dessert fruits. Juneberries are as yet little used where they must compete with other fruits, although they have many qualities to commend them for domestication.

The fruit of the juneberry is a small pome

THE MEDLAR

or apple, usually with five cells, each more or less completely divided into two parts so that there appear to be ten cells. The pomes of some species are no larger than a pea, while in the best strains of other species they attain the size of a small crab-apple. They vary in color from dark red to a purplish-blue or black and all have more or less bloom. The several juneberries are exceedingly variable in their fruits, suggesting high potentialities in the domestication of the best of the wild species. They differ much in the character of the plants, some species being dwarf shrubs with many stems, while others are small trees with straight, slender trunks, the largest of which attain a height of forty feet and a diameter of eight or ten inches. All are hardy, and at least two of them give promise of making most desirable domesticated plants in regions too cold for any, or but few, other fruits. Juneberries thrive under the same care as that given the apple or pear. The genus shows wide adaptation to soils and moisture conditions; in temperate regions there are few localities where other fruits are grown in which some one or several of the juneberries would not thrive.

Strains of several species have been brought under cultivation, some of which have been named and sparingly disseminated by nurserymen. So far, all of the cultivated varieties have come from the bush-like species, most of them from *A. alnifolia*. One of the first named sorts to be sent out was Success, a dwarf strain probably of *A. canadensis*, introduced by H. E. Van Deman, then of Kansas, about 1878; this variety seems to be no longer cultivated. Several western nurserymen now offer strains of *A. alnifolia* under the names Improved Dwarf Juneberry, Dwarf Mountain Juneberry, and Western Huckleberry. These named varieties are selected strains from wild plants, no one as yet having set out to improve juneberries. There are many distinct forms in the wild, some of them supposed to be natural hybrids, offering opportunities for selection in the amelioration of the species for the garden. There is no reason to believe that the species will not hybridize as freely as other members of the rose family. Juneberries are readily propagated from seeds and no doubt all would yield to budding and grafting. They are said to be easily budded on the hawthorn. At present, suckers are used in propagating the species.

THE MEDLAR

The medlar, or mespil, is a small, handsome tree belonging to the genus Mespilus which bears edible fruits. The genus is closely related to Crataegus and Pyrus. It is separated from Crataegus by its large flowers, which are borne singly and have leaf-like sepals, and by its stemless fruits. It differs from Pyrus, with which it is sometimes classed, in bearing its flowers singly on leafy shoots of the current year's growth; in having an open-topped, overgrowing receptacle which does not cover the ovaries; and in its apparently stemless fruits. There is but one species.

Mespilus germanica, Linn. Medlar. Mespilus. Plant a small tree attaining a height of 25 feet, sometimes shrub-like, the wild plants thorny, cultivated varieties thornless. Leaves simple, nearly sessile, oblong-lanceolate or oblong, pubescent, serrate. Flowers large and sessile on short, leafy shoots, white or pink, pubescent outside; styles 5, glabrous and distinct. Fruit a roundish or top-shaped pome with the 5 leaf-like sepals persistent; receptacle hollowed as in the apple and pear, but not completely inclosing the carpels; the 5 carpels having a hard, bony wall protecting the single seed within.

At least two botanical varieties are named, one a large-fruited form, and the other seedless, both of which, from the descriptions given, might well be considered pomological varieties. The medlar is a native of Europe, being found wild in many parts of central and southern Europe and even in England, where, however, it is probably an escape from cultivation. It is thought to be indigenous to south-central

4. Dutch Medlar. (×½)

Europe eastward to the Caucasus. The medlar is said to hybridize with the hawthorns.

The medlar, it seems, held a much higher place among fruits in the Middle Ages than now. It was used as a preserve and to season meats. The fruit was the foundation of the famous preserve known in Orléans, France, as *cotignac*, which was always offered a French sovereign when he entered the town, and which was the first present made to Joan of Arc when she led her troops into that city. The fruit is somewhat common in the markets of France, very common in Germany, and sometimes is to be found on fruit-stalls in England. Medlars are to be seen in many door-yard plantations in the South Atlantic and Gulf states in the United States, but are seldom seen northward, although they are hardy as far north as Geneva, New York. In parts of Florida, the medlar is very common, being used as a hedge-plant as well as a fruit-plant, and is frequently found in a semi-wild state.

When plants or seeds were first brought to America is not known; American pomologies and horticultural magazines give but scant and fragmentary information on the subject. It seems certain, however, that the plant has

been known in the South, especially about New Orleans, for two centuries at least, probably brought there from France by French Jesuits.

The tree is small but handsome; often, especially in the North, it is a much-branched, twiggy shrub. In central New York it bears showy white blossoms late in May or early in June, when the soft, luxuriant foliage is well out. The roundish or top-shaped fruit is reddish-brown with firm, austere flesh which is unpalatable until mellowed and sweetened by frost or decay. After the period of decay, called in England *bletting,* the fruit has a rich subacid flavor much prized by those accustomed to it.

Medlar stocks may be grown from seed; or the varieties may be budded or grafted on the pear, quince, or thorn. Usually the seeds will not grow the first year, but require stratification through this period. Three varieties are grown in England, compiled descriptions of which are herewith given.

DUTCH. Tree weeping, very handsome and much used as an ornamental. Leaves large, soft, luxuriant. Flowers very large and showy. Fruit large, 2½ inches in diameter, ripening in October, edible before Christmas; not the best in quality, but the most generally grown because of the tree.

ROYAL. Tree more upright, with smaller leaves than the former; more productive. Fruit smaller and scarcely as good as that of Dutch.

NOTTINGHAM. Tree of upright growth, fewer branches and sparser foliage than in the two former. Fruit smaller, brisker and better flavored, being the best of the medlars. Nottingham is sometimes called the small-fruited medlar to distinguish it from Dutch which is called the large-fruited or monstrous.

THE MEDLAR

CHAPTER III

VARIETIES OF APPLES

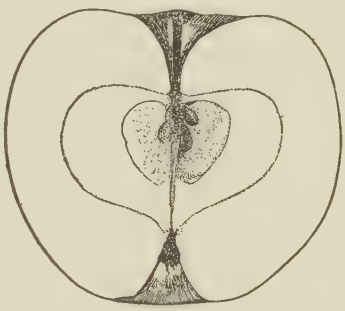
Probably not less than 2500 apples have been named or described in America. Possibly twice as many more names have appeared in the horticultural literature of the world. Commercial fruit-growing demands few varieties, and with the change from the growing of fruit for personal use and pleasure to the commercial orcharding which is taking place in America, the number of apples under cultivation annually grows less, until it is doubtful whether as many as 300 names appear in current literature; in fact, a count of varieties offered by nurserymen in 1920 shows only about 200, not a few of which are recent introductions that ought not to be considered established sorts. In this text, only standard varieties are described—those grown extensively for home or market at the present time; those that are generally on probation among fruit-growers or experiment stations; and a few old sorts that have historical value or are still to be found in old orchards. All full descriptions were made at the Experiment Station, Geneva, New York, while the abbreviated ones have been compiled.

5. Akin. (×½)

AKIN. Fig. 5. *Akin Red.* Akin is a handsome dark red, late winter-apple of medium size and very good quality. It is adapted to southern regions, though the fruits usually mature as far north as central New York. It succeeds best in the Middle West and on rich warm soils. Akin is especially adapted to the needs of the fancy fruit trade. The variety originated from seed planted near Lawrenceville, Illinois, in 1831 by W. J. Akin.

Tree upright-spreading, dense, vigorous; branches long, stout. Leaves large, broad. Fruit medium, round-oblate, often irregular, slightly ribbed, sides sometimes unequal; stem long, slender; cavity obtuse, broad, shallow, often distinctly furrowed and corrugated; skin tough, smooth, yellow, blushed and striped with bright deep red, in well-colored specimens almost completely red; dots small, white; calyx-tube conical; stamens median; core abaxile, open or partly closed; core-lines meeting; carpels elliptical, emarginate; seeds dark brown, long, narrow, acute, numerous; flesh yellow, crisp, coarse, tender, very juicy, subacid, aromatic; good to very good; January to June.

ALBEMARLE. See Green Newtown.



6. Alexander. (×½)

ALEXANDER. Fig. 6. *Aporta.* Alexander has many merits but some faults. Merits of the trees are vigor, hardiness, productiveness, earliness and regularity of bearing; of the fruits, large size and handsome appearance. The chief fault of the tree is susceptibility to blight. The apples fail in being coarse in texture and so poor in quality as to be suitable only for culinary purposes; in ripening unevenly and so requiring several pickings; in dropping prematurely; and in not keeping well in either common or cold storage. The variety is much used as a filler in some apple regions, and as a permanent tree where hardiness is a determinant. Its cultivation is everywhere common in northern apple regions. Alexander was introduced into England in 1817; when into America is not known.

Tree large, vigorous, with long stout branches, upright-spreading, open, somewhat drooping. Fruit large, uniform in size and shape, round-conic to oblate-conic, regular or approaching broadly angular, symmetrical; stem short, thick; cavity acute, deep, broad, symmetrical, occasionally lipped, russeted, often with broad, conspicuous outspreading russet rays; calyx large, open; lobes short, narrow, acute; basin small, deep, narrow, abrupt, smooth, symmetrical; skin thick, tough, smooth, glossy, waxen, pale yellow deepening to orange-yellow in the sun, overspread with lively red or striped and splashed with carmine; dots inconspicuous, scattering; prevailing effect red or striped; calyx-tube variable, long, wide, conical; stamens median; core small, usually axile; cells closed or slightly open; core-lines clasping; carpels elliptical, emarginate; seeds wide, short, plump, obtuse; flesh faint yellow, firm, coarse, crisp, tender, juicy, mild subacid; fair to good; September to November.

ANISIM. According to N. E. Hansen, in charge of pomology at the South Dakota Experiment Station, Anisim is a most valuable apple in the northern states of the Great Plains. It seems not to be grown elsewhere in the United States. The variety is a Russian sort introduced into Canada about 1885. The following is the description given by Hansen:

"Tree a strong grower in the nursery and orchard and a prodigious bearer; young trees upright, spreading with age; limbs long, slender with a very strong shoulder; leaves narrow, pointed, dark green. The beautiful color of the fruit attracts favorable attention. Fruit below medium, roundish-conical, slightly angular; surface greenish-yellow, covered almost wholly with a beautiful dark crimson, with heavy blue bloom; dots white, minute; cavity regular, acute, usually slightly russeted; stem medium; basin narrow, very shallow, corrugated, sometimes flat; calyx closed. Core closed, clasping; tube short, broad; stamens median; flesh greenish-white, with green veins, good; early winter."

ARCTIC. Arctic, as the name implies, is an apple for cold climates, much hardier than Baldwin or Northern Spy, but not so hardy as several of the Russian apples. The trees are vigorous, healthy, and usually productive; but the fruit, while pleasing in appearance, is far from good in quality. Arctic originated as a seedling on the farm of John H. Esseltyne, Cape Vincent, New York, about 1862.

Tree a moderate grower, spreading and open, with long, stout branches. Leaves large, dark green, broad and thick. Fruit large, oblate, sometimes round-conic, often faintly ribbed, uniform in size and shape; stem short and thick; cavity shallow, broad, usually symmetrical or furrowed and having outspreading rays of red or green-russet; calyx large, segments broad, obtuse, closed; basin abrupt, wide and deep, often compressed or furrowed and corrugated; skin smooth, slightly roughened by light russet or white dots, deep yellow almost wholly covered with bright red obscuring stripes of deeper red; calyx-tube short, conical; stamens median; core medium, axile; cells closed or partly open; core-lines clasping; carpels broadly round to obcordate, emarginate, tufted; seeds often abortive, large, flat, obtuse, sometimes tufted, dark; flesh yellow, firm, coarse, crisp, juicy, mild subacid; good in quality; October to February.

ARKANSAS. *Mammoth Black Twig. Arkansas Black.* Arkansas is a large, dull, deep red, striped, late-keeping winter-apple of good quality, much grown in the South and Southwest. In the North the fruits are usually small, poorly colored, and otherwise undeveloped. North and South, the trees are unproductive. Arkansas was grown from a seed planted in 1833 near Rhea Mills, Arkansas. It resembles Winesap, of which it may be a seedling, and Paragon, to which it is similar. It is often confused with Arkansas Black because of similarity in name.

Tree large, vigorous, upright-spreading; branches large, crooked, stout, open. Fruit large, uniform in size, round to conic, sometimes oblate, broadly ribbed, uniform in shape; stem long or short, stout; cavity acute, wide, medium in depth, green, often much russeted, sometimes indistinctly furrowed; calyx small, closed; basin abrupt, wide, deep, broadly furrowed or wavy; skin smooth, dull green, often becoming deep yellow, overspread with a dull deep red, obscurely striped with darker red; dots small, russet, inconspicuous; calyx-tube conical; stamens median; core axile, closed; core-lines clasping; carpels broadly ovate, deeply emarginate, tufted; seeds few, variable, long, narrow, acute, tufted; flesh yellow, very firm, fine-grained, tender, juicy, subacid, crisp; good; December to May.

ARKANSAS BLACK. *Arkansas Black Twig.* Arkansas Black is a beautiful dark red, late-keeping apple of very good quality. Unfortunately, the trees are so unproductive as to make the variety hardly worth planting, even for home use. It is profitably grown only in the South and Southwest. The variety originated in Benton County, Arkansas, about 1870.

Tree vigorous, upright-spreading, open; branches long, slender. Fruit medium or rarely large, uniform in size and shape, nearly round; cavity acute, small, sometimes lipped, partly russeted; calyx small, closed; basin obtuse, shallow, slightly furrowed, faintly corrugated; skin smooth, waxy, yellow covered with a lively red deepening to almost black on the exposed side; dots small, inconspicuous; calyx-tube conical; stamens marginal; core small, abaxile, closed or partly open; core-lines clasping; carpels concave, roundish, emarginate; seeds plump, short, obtuse, dark brown; flesh yellow, firm, fine-grained, crisp, juicy, sprightly subacid; good to very good; December to April or later.

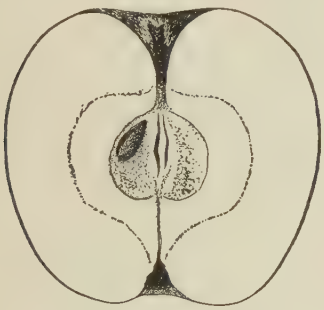
BABBITT. *Western Baldwin.* If the fruit were not quite so acid, and the trees were more productive and more regular in bearing, Babbitt would be rated as a valuable variety. The apples are large and often strikingly handsome, while the trees are hardy, healthy, vigorous, and productive. The variety is of value as a culinary fruit, since the apples retain their sprightly subacid flavor throughout late winter. It is grown most largely in the Mississippi Valley. Babbitt is a seedling of Baldwin grown by C. W. Babbitt, Woodford County, Illinois, about 1845.

Tree very vigorous, spreading, open; branches stout, often crooked. Leaves large, broad, dark green, thick. Fruit large, round-oblate, angular and irregular; stem short; cavity obtuse to acute, shallow, broad, russeted; calyx closed; basin abrupt, deep, furrowed, corrugated; skin bright, pale yellow with mottled red cheek, striped with bright carmine; calyx-tube conical; stamens median; core small, axile, closed; core-lines clasping; carpels broad, round, truncate; seeds dark brown, small; flesh yellow, fine-grained, crisp, juicy, sprightly subacid; good to very good; November to May.

BAILEY SWEET. *Howard's Sweet.* Despite many faults, Bailey Sweet is largely grown in many parts of America because of its rich, sweet fruits—agreeable to all who like sweet apples. The trees lack vigor, health, and hardiness,—defects offset somewhat by productiveness and regularity in bearing. The fruits are susceptible to the scab fungus, do not keep well, are often malformed, and are not uniform in size. The origin of the variety is not known, further than that it was disseminated from Perry, New York. The first description was published by Thomas in 1849.

Tree upright-spreading, open; branches slender. Leaves large. Fruit large, round-conic, or oblate, ribbed obscurely, symmetrical, sides elliptical, uniform in size and shape; stem short; cavity acute, deep, furrowed, sometimes with sides compressed or lipped, often with thin golden-brown russet; calyx closed, small with short obtuse lobes; basin shallow, narrow, obtuse, furrowed or corrugated, often with mammiform protuberances; skin tender, smooth, clear bright yellow covered with deep red, mottled or striped with darker red, often with irregularly netted markings and dots; calyx-tube funnel-shape, wide limb; stamens median; core axile, closed; core-lines clasping; carpels elliptic, emarginate; seeds large, long, acute; flesh yellow, firm, coarse, crisp, tender, juicy, sweet, agreeable in flavor; very good in quality; October to January or later.

BALDWIN. Fig. 7. *Pecker. Steele's Red Winter. Woodpecker.* Baldwin is the standard winter apple of eastern America, and is more largely grown than any other variety of this fruit on the continent. It takes its high rank from several characters, chief of which is adaptability to a great diversity of soils and climates. Other good qualities are: the fruits keep long; are uniformly large; when well grown, are attractive in color; the quality, while not of the best, is good; and the apples, because of firm texture and thick skin, stand handling and shipping well; this fact makes it the standard variety for both home and foreign markets. The trees are vigorous, long-lived, healthy, and remarkably productive, individual trees not infrequently bearing twenty barrels of apples, and the crop is usually uniform. The trees are faulty in bearing biennially, in falling a little below the average of the species in



7. Baldwin. (×½)

hardiness, and in being susceptible in both fruit and foliage to the apple-scab fungus. Baldwin originated about 1740 as a chance seedling on the farm of John Ball, Wilmington, Massachusetts.

Tree large, very vigorous, upright-spreading; branches stout. Leaves large. Fruit large, round-conic to round-oblong, often faintly ribbed or irregular, uniform in shape; stem medium to long; cavity acute, deep, broad, often furrowed, sometimes compressed, sometimes lipped, often russeted with outspreading rays of russet or green; calyx small, closed or open, with long lobes, acuminate; basin abrupt, narrow to wide, often furrowed, corrugated; skin tough, smooth, light yellow, blushed and mottled with red, striped with deep carmine; dots gray, depressed, small and numerous toward the basin, conspicuous towards the cavity; calyx-tube conical, short and wide with projection of fleshy pistil point into its base; stamens basal; core medium, axile, closed or partly open; core-lines meeting; carpels round-ovate, emarginate, tufted; seeds variable, large, long, acute, dark brown; flesh yellow, firm, coarse, crisp, tender, juicy, agreeably subacid, sprightly, aromatic; good to very good; November to March or April.

BANANA: See Winter Banana.

BANKS. *Banks Gravenstein.* Banks is a bright red Gravenstein, differing in no other important particular than color. Some say that the apples are smaller, less ribbed, and more regular in shape. Banks is a bud-variation of Gravenstein, first noticed and propagated by C. E. Banks, Berwick, Kings County, Nova Scotia, about 1880.

Tree large, vigorous, upright-spreading, open. Fruit large, uniform in size but not in shape, oblate or round, somewhat irregular, broad at the base, angular, narrow to broad, irregularly russeted; calyx large, open or closed, with lobes large, long, very broad, acute; basin irregular, wide, obtuse to abrupt, wrinkled; skin thin, tender, rough, greenish-yellow or orange-yellow overlaid with broken stripes of light and dark red; dots few, small, light; prevailing effect yellow striped; calyx tube large, conical; stamens median; core medium in size, strongly abaxile; cells open; core-lines clasping the funnel cylinder; carpels broad-ovate, emarginate; seeds large, long, plump, acute, brown; flesh yellow, firm, fine, crisp, tender, juicy, sprightly subacid, aromatic; very good to best; late September to early November.

BAXTER. *Baxter's Red. Red Pound.* The bluish bloom, large areolar dots, large size, form, color, and the flesh and flavor of the fruits of Baxter, all indicate close relationship to Blue Pearmain. In quality, the apples are only fair, but immunity to fungi and the great hardiness of the trees make the variety desirable in regions too cold for Baldwin or Northern Spy. Baxter came into local repute at Brockville, Ontario, about 1800.

Tree productive, very vigorous, upright-spreading, open; branches long, stout. Leaves large. Fruit large to very large, round-conic, faintly ribbed, sides often unequal, axis sometimes oblique; stem short; cavity large, deep, acute, partly russeted, furrowed; calyx small, closed or partly open; basin oblique, shallow to deep, narrow, obtuse, furrowed, corrugated; skin thick, tough, roughened by russet dots, pale yellow mottled and blushed with bright red deepening to darker shades, splashed and striped with purplish-red; dots numerous, conspicuous, areolar; bloom heavy; prevailing effect red or striped red; calyx-tube large, elongated, funnel-form; stamens median to marginal; core abaxile, open; core-lines clasping; carpels elongated-ovate, emarginate, tufted; seeds numerous, small, wide, plump, obtuse, tufted, dark brown; flesh yellow, sometimes stained with red, firm, breaking, coarse, tender, juicy, mild, subacid, aromatic; fair to good; November to January.

BEACH. *Apple of Commerce.* Beach has been widely distributed in the United States and Canada, and is now offered by many nurserymen. It is not likely to become widely grown, and yet it should be known for its late-keeping fruits. The apples are pleasant to eat—hardly among the best—but are not attractive in form or color. The variety was first described in Arkansas in 1898.

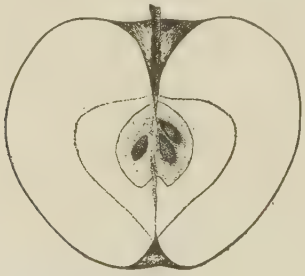
Tree large, vigorous, productive, round, dense; branches stocky. Leaves large, long; petioles red at base. Fruit medium in size and uniform in size and shape, round-obovate, sometimes oblate, regular, symmetrical; stem slender; cavity acuminate, deep, wide, green or with outspreading russet, symmetrical; calyx closed; basin shallow to deep, obtuse, wide, furrowed, corrugated, often with mammiform protuberances; skin thick, tough, smooth, bright yellow, shaded and mottled with red and striped with dark carmine; dots inconspicuous, small, gray; prevailing effect red or red striped; calyx-tube narrow, deep, conical, with fleshy projection of pistil point into its base; stamens median; core axile, large, closed; core-lines clasping; carpels broadly ovate, emarginate; seeds large, narrow, long, acute; flesh yellow, very firm, coarse, subacid; fair to good in quality; very late.

BELMONT. *Golden Pippin. Waxen.* This beautiful and choice cooking and dessert apple seems on the way to oblivion in the East, but is still rather commonly grown in the Pacific states as Waxen. Its chief faults are in the fruits, which bruise readily, do not keep well, and lack uniformity in size; but the trees fail also in that they are not reliably fruitful and

are subject to sun-scald and canker. Belmont originated in the garden of a Mrs. Beam, Lancaster County, Pennsylvania, about 1800, but was introduced and named many years after from Belmont County, Ohio.

Tree of medium size, upright-spreading, vigorous. Fruit medium or large, uniform in size and shape, round-oblong to oblate-conic, broadly and indistinctly ribbed, irregular; stem short, slender; cavity large, acuminate, deep, broad, wavy, irregular, usually with thin brown russet, sometimes lipped; calyx small, closed; basin shallow to deep, abrupt, furrowed and wrinkled; skin thick, tough, smooth, waxen, clear bright yellow with bright orange-red blush; dots whitish with minute russet point, often submerged, on the blushed portion becoming red areolar; prevailing color yellow; calyx-tube long, elongated-cone-shaped; stamens marginal; core large, axile, sometimes closed; core-lines clasping; carpels round-cordate, tufted; seeds long, acute, tufted; flesh yellow, firm, fine, crisp, tender, juicy, mild, subacid; very good; October to February.

BEN DAVIS. Fig. 8. *Baltimore Pippin. Kentucky Pippin. New York Pippin. Red Pippin. Victoria Pippin.* Ben Davis has the high place in the South and Middle West that Baldwin holds in the North and East, and, even in the latter regions, it ranks among the leading half-dozen commercial apples. But for the fatal fault of poor quality, Ben Davis would probably surpass Baldwin as a commercial variety, since it is least of all apples subject to local prejudices as to soils and climates, and about the latest in season, and since it stands shipping and handling better than any other standard apple. Nurserymen like the variety because the young trees make a rapid and presentable growth where those of other varieties often fail.

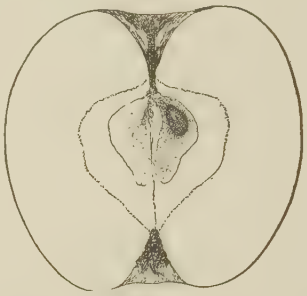


8. Ben Davis. (×½)

The trees are vigorous, thrifty, hardy, healthy, bear young, annually, and abundantly, blossom late, and are, all in all, ideal in every respect except that they are short-lived and produce small apples as they grow old. The apples are large, uniform in size and shape, and are handsomely mottled, striped and splashed with bright red on a yellow background. There are few more beautiful apples. Looks belie the taste, however, as the fruits are poor in quality, though in the late spring they are acceptable for dessert, as they are at all times for cooking. The origin of Ben Davis is not known, but it has been cultivated in parts of the South since about 1800. It seems not to have been described until the 1857 edition of Downing's great book.

Tree medium in size, very vigorous, upright-spreading; branches strong, with numerous short laterals and spurs, drooping. Leaves large. Fruit medium to large, varying from conic to oblong, broad, rounded at the base, often elliptical or irregular, sides sometimes unequal, uniform in shape and in size; stem long, slender; cavity acute, deep, symmetrical, often with rays of thin greenish-russet; calyx closed, with short, acute lobes; basin abrupt, medium in width and depth, obtuse, sometimes furrowed, usually oblique; skin tough, waxy, bright, smooth, glossy, yellow, mottled and washed with bright red, striped and splashed with carmine; dots inconspicuous, scattering; prevailing effect bright deep red, striped; calyx-tube short, cone-shaped, with a long cylinder, frequently with a fleshy projection of pistil point into its base; stamens median; core axile, closed or partly open; core-lines clasping; carpels flat, obovate, emarginate, mucronate; seeds large, long, irregular, wide, plump, acute, dark brown; flesh yellow, firm, coarse, aromatic, juicy, mild subacid; good; January to June.

BENONI. Fig. 9. Benoni falls short of being a most excellent market and home apple through the smallness of the fruits, and the unproductiveness and biennial bearing habit

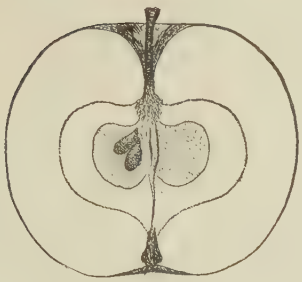


9. Benoni. (×½)

of the trees. When well grown it is a beautiful and delicious dessert apple. The variety originated at Dedham, Massachusetts, sometime before 1832, when it was first described. It is now chiefly grown in Illinois, Missouri, and neighboring states.

Tree large, vigorous, erect or round-topped, dense. Fruit medium or small, round-conic, faintly ribbed toward the apex, sides unequal; stem short or very short, slender; cavity acute, narrow, deep, wavy, greenish-russet; calyx small, partly open, pubescent; basin medium in width and depth, abrupt, wrinkled; skin smooth, orange-yellow, partly covered with red striped with carmine; dots scattering, minute, white; stamens basal; core small, axile; cells closed; core-lines meeting; carpels round, elongated, emarginate; seeds few, dark brown, medium in size, plump, obtuse; flesh yellow, firm, crisp, fine-grained, tender, juicy, pleasant subacid; good to very good; August and early September.

BETHEL. Fig. 10. Bethel falls at once through its fruit and tree characters into the well-known Blue Pearmain group of apples. It is probably worth planting only in regions where Baldwin is injured by cold. The apples are bright dark red, uniform in size, fair in quality, and keep well, but do not ship well. The trees are vigorous, healthy, hardy, long-lived, fruitful, bear young and annually, but often lose the crop before picking time. The stem of Bethel is characteristically curved to one side. Culture of the variety is largely confined to the New England states. Bethel is often confused with Stone, but the two, as the descriptions show, are quite distinct. The variety originated at Bethel, Vermont, some time previous to 1886.



10. Bethel. (×½)

Tree large, vigorous, round, spreading. Fruit large, round-conic, angular or irregularly elliptical; stem short, slender; cavity acuminate, deep, broad, symmetrical, with red-russet often outspreading; calyx pubescent, large, open or closed; basin shallow, wide, furrowed and wrinkled; skin thick, tough, smooth, yellow, washed and mottled with red and striped with carmine, dark red in highly colored specimens; dots numerous, conspicuous, russet or light, many small and some large and areolar; calyx-tube very large, wide, funnel-shaped with a short cylinder; stamens median; core large, abaxile, open or closed; core-lines clasping; carpels broad, round-ovate, emarginate, tufted; seeds large, wide, long, acute to acuminate, tufted, brown; flesh yellow, firm, coarse, crisp, tender, juicy, mild subacid; fair to good; November to March.

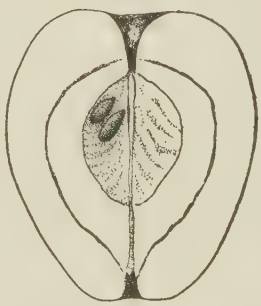
BIETIGHEIMER. *Red Bietigheimer.* The fruits are of largest size, for which and for their beauty of form and color, the variety is remarkable. On the other hand, the apples are coarse, poor in quality, and drop badly during the maturing period. The trees are hardy and healthy, and come into bearing early, but are among the unmanageables of orchard and nursery, and are seldom fruitful. The variety was introduced from Germany about 1870, and is now more or less grown in the colder parts of America.

Tree large, vigorous, upright-spreading, dense, with drooping laterals. Fruit very large, uniform in size and shape, round-oblate, with broad, flat base, somewhat irregular; stem short, thick; cavity large, acute, wide, shallow, sometimes furrowed, occasionally lipped, often much russeted and with outspreading russet rays; calyx small, closed, with narrow, acute lobes; basin shallow and obtuse to deep and abrupt, wrinkled, often marked with mammiform protuberances; skin thick, tough, smooth, pale yellow washed with pinkish-red, sparingly and obscurely splashed with deeper red; dots numerous, small, inconspicuous, yellow or russet; calyx-tube broadly conical; stamens basal; core medium to large, axile; cells partly open; core-lines clasping; carpels cordate or broadly roundish, tufted; seeds numerous, large, wide, broadly acute, light brown; flesh white, firm, very coarse, crisp, tough, juicy, subacid; fair to good; September and October.

BISMARCK. Bismarck is of the type of the better-known Alexander. The quality of its fruit is so poor, that, were it not for several remarkable characters of the trees, the variety could hardly obtain standing with fruit-growers. The trees begin bearing as soon as established, often when one or two years set, sometimes in the nursery row; they are also hardy, healthy, productive, and annual in bearing; and have a dwarf habit, scarcely attaining the dignity of a tree, a fact which fits them admirably for fillers and for close plantings. The apples are large and handsome, but too poor in quality for even a good culinary fruit. Bismarck originated in the Province of Canterbury, New Zealand, and was introduced into America from England about 1895. Its culture is restricted in America to the northern states and Canada.

Tree dwarf, spreading, open with very short, stout drooping branches. Fruit large, uniform in size and shape, round-oblate or round-conic, flattened at the base, regular, sides often unequal; stem short, thick; cavity large, acuminate, wide, deep, often compressed, green or russet with outspreading russet rays; calyx large, open, with short, broad, obtuse lobes; basin large, usually symmetrical, deep, wide, abrupt, sometimes broadly furrowed and wrinkled; skin thick, tough, smooth, yellow washed, mottled and striped with two shades of red becoming solid dark red on the exposed cheek, overspread with thin bloom and often marked with scarf-skin about the base; dots minute, russet or large and pale gray; prevailing effect red; calyx-tube wide, broadly conical; stamens basal; core small, axile to abaxile; cells closed or open; core-lines meeting; carpels flat, broadly ovate, tufted; seeds few, often abortive, wide, short, plump, obtuse, brown; flesh white, firm, coarse, tender, juicy, subacid; fair to good; October to early winter.

BLACK BEN DAVIS.—Black Ben Davis is either a seedling or a bud-mutation of Ben Davis, from which it differs in bearing dark red apples scarcely broken in color, whereas in Ben Davis the red fruits are striped, splashed, and mottled. Despite the fact that the evidence seems to show that they are of distinct origin, Black Ben Davis and Gano may be considered identical. The variety is said to have originated on the farm of M. Black, Washington County, Arkansas, about 1880. Its culture, as an apple of commerce at least, is restricted to its native state and the nearby states.

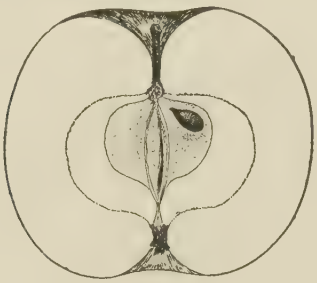


11. Black Gilliflower. (×½)

BLACK GILLIFLOWER. Fig. 11. *Gilliflower. Red Gillflower.* Black Gilliflower, threatened with oblivion, is again being planted. The distinct form, color, flavor, and aroma of the apples, as pictured in the technical description, mark it as an unusual and attractive fruit, fit for dessert, and excellent for cookery. The apples, eaten out of hand or however cooked, have a rare, sweet flavor and aroma, most agreeable to many. They are, also, usually perfect, uniform in size and shape, and keep very well in either cold-storage or the cellar. The trees are vigorous, healthy, and fruitful. Black Gilliflower was

known in New England as early as the Revolutionary War; thence its culture has spread southward to the Carolinas and westward to the Mississippi.

Tree large, vigorous, upright-spreading. Leaves long. Fruit medium to large, uniform in size and shape, oblong-conic, ribbed, axis sometimes oblique; stem long, thick; cavity acuminate, wide, lipped but usually symmetrical, with red-russet or greenish outspreading rays; calyx closed; basin often oblique, shallow and obtuse to deep and abrupt, furrowed and wrinkled; skin thick, tough, smooth, yellow, striped or covered with red, deepening to almost black, obscurely striped with darker crimson and with streaks of scarf-skin, giving the effect of dull bloom; dots numerous, gray, small, rough; prevailing effect dull gray-purple; calyx-tube large, wide, cone-shape; stamens median; core large, axile, closed; core-lines clasping; carpels long-ovate, tapering both ways, emarginate, tufted; seeds often abortive, when developed of medium size, acuminate, tufted; flesh yellow, firm, tender, coarse, juicy becoming dry, mild subacid, rich, peculiarly aromatic, good; October to January or February.



12. Blue Pearmain. (×½)

BLUE PEARMAIN. Fig. 12. Blue Pearmain is characterized by its bluish bloom, deep purplish color, ribbed or sometimes furrowed surface, thick skin, the mild pleasant flavor of its fruits, and the hardiness of the trees—all of which characters it seems to have transmitted little changed to a numerous progeny. The fruit does not keep well, and the quality is not sufficiently high to make the variety worthy except where hardiness is necessary. Blue Pearmain is known to be at least a hundred years old, but is of uncertain origin. It was first described by Kenrick in 1833. The variety is widely grown only in New England.

Tree large, vigorous, spreading. Leaves broad, coarsely serrated. Fruit large to very large, uniform in size and shape, round to oblate, inclined to conic, irregular, often obscurely ribbed, sometimes distinctly furrowed from the cavity nearly to the basin; stem short, thick; cavity deep, obscurely furrowed, usually covered with orange-russet or greenish-russet; calyx partly open, acute lobes; basin medium in depth and width, with concentric gray or russet lines, obscurely furrowed; skin rough, yellow, washed and mottled with red, often deepening on one side to nearly solid red, splashed and striped with deep purplish-carmine and overspread with an abundant blue bloom; dots numerous, small, pale, mingled with others which are conspicuous, very large, gray with russet center and often also mingled with irregular lines or flecks of dull green or russet; calyx-tube elongated-conical; stamens basal; core large, axile, closed or open; core-lines clasping; carpels broad, elongated or round, tufted; seeds long, acuminate, light brown; flesh yellow, firm, coarse, juicy, mild, subacid, agreeably aromatic; good; October till March.

BOGDANOFF GLASS. *Bogdanoff. Sklanka.* This variety may have some value in cold regions, since it is a hardy Russian sort. Unfortunately, the quality of the fruit is not high, but the apples are handsome in appearance and keep well. The variety was imported from Russia to America about 1880.

Tree vigorous, upright-spreading, open; branches long, curved, stout. Leaves broad. Fruit large, uniform in size and shape, round-conic sometimes approaching round-oblate, obscurely ribbed, usually symmetrical, sometimes elliptical or irregular; stem short, thick, often swollen at the base, sometimes knobbed; cavity acuminate, shallow to deep, broad, furrowed, wrinkled; skin thin, tough, smooth, waxy, glossy, green becoming bright pale yellow, occasionally with faint bronze blush; dots numerous, inconspicuous, mostly submerged, white or green; calyx-tube large, long, cone-shaped; stamens median; core axile, closed or open; cells often unsymmetrical; core-lines meeting or clasping; carpels smooth, broadly obovate, emarginate; seeds light reddish-brown, smooth, wide, plump, obtuse to acute; flesh white, firm, fine, crisp, tender, juicy, brisk subacid; fair to good; November to February.

BOIKEN. Boiken was one of the marvels of the American horticultural press at the close of the nineteenth century. The apples are most attractive in color—bright yellow with a beautiful blush—but the variety was heralded in this country chiefly because of the vigor, health, productiveness, hardiness and, more than all else, the early bearing habit of the trees. The leaves are distinctive because of their great size, rich green color, and immunity to apple-scab. Unfortunately, the fruit is so austere as to be hardly fit to eat out of hand; even cooking does not sufficiently take away the sourness. The apples are in demand at evaporators, the cured product being remarkable for its light color. The variety is now falling into disrepute. It is grown chiefly in cold regions, and where an early-bearing sort is wanted. Boiken came to America from Germany, where it has long been cultivated.

Tree vigorous, spreading, dense; branches short, stout, crooked. Leaves large. Fruit medium to large, uniform in shape but uneven in size, oblate, broad at the base, conical, often ribbed, symmetrical; stem long; cavity obtuse, very broad, furrowed, sometimes compressed, partly colored with thin brownish-russet; calyx large, closed or open, acute lobes; basin oblique, wide, abrupt, deep, furrowed and wrinkled; skin tough, smooth, waxy, pale yellow, often with sharply contrasting brilliant red blush; dots numerous, small, often red-areolar, with white or russet center, often submerged; prevailing effect yellow with red blush; calyx-tube large, funnel-form, often extending to the core; stamens median; core large, open, abaxile; cells usually symmetrical; core-lines clasping; carpels concave, very broad, elliptical, emarginate, tufted; seeds plump, obtuse to acute, dark; flesh white, firm, crisp, tender, fine-grained, very juicy, sprightly, brisk subacid, not high in quality; good; November to February or March.

BONUM. *Magnum Bonum.* Bonum is a standard variety in the South, valued for its productive trees and the high quality of its apples, qualities which it attains only when grown under favorable conditions. The variety is of little value north of the Potomac and Ohio. It originated in Davidson County, North Carolina, about 1840.

Tree vigorous, upright-spreading or round-topped, open. Fruit medium to large, oblate, regular; stem long, slender, green; cavity large, deep, regular, often with a little green-russet; calyx large, closed; basin shallow, wrinkled; skin smooth, yellow, mostly cov-

ered with crimson and dark red, striped; dots distinct, large, light with some having a dark center; calyx-tube funnel-form; stamens marginal; core small; cells closed; core-lines meeting; carpels ovate; seeds numerous, large, plump; flesh white, often stained next to the skin firm, fine, tender, juicy, aromatic, mild subacid; very good; September to November.

BOROVINKA. *Barovitsky. Mushroom.* This apple is very similar to the far better known Oldenburg and serves the same purposes. It was imported from Russia about 1875.

Tree small size but vigorous, upright-spreading, open. Fruit medium to large, uniform in shape but not in size, round, flattened at the ends, regular or faintly ribbed; stem medium in length, thick; cavity acute, shallow, broad, furrowed, sometimes with faint radiating rays of russet; calyx large, closed, with broad lobes; basin deep, wide, abrupt, furrowed, occasionally with mammiform protuberances; skin thin, very tender, smooth, pale yellow, often covered with broken stripes and irregular splashes of bright red, overspread with thin bloom; dots numerous, conspicuous, small, light colored; calyx-tube large, wide, urn-shape widening in the lower part of the cylinder; stamens median; core small, axile; cells closed; core-lines clasping; carpels round, concave, mucronate; seeds large, wide, plump, obtuse, dark brown; flesh yellow, crisp, tender, juicy, subacid, aromatic; good; mid-August to mid-September.

BORSDORF. *Borsdorfer.* Borsdorf is considered a first-class dessert apple in Europe, but in America falls far short of this rank. The tree, however, is very hardy and productive, and because of these characters the variety may well be planted in northern regions. It was introduced into America from Germany, probably about 1830. It is a very old sort, and some believe it to be the apple mentioned by Cordus in 1561.

Tree moderately vigorous, round, dense; branches long, slender, with numerous small laterals. Leaves broad. Fruit medium to small, oblate, somewhat ribbed, sides unequal, uniform in size and shape; stem long, slender, often inclined obliquely; cavity shallow to deep, wide, obtuse, often furrowed and russeted; calyx large, partly open; basin shallow, wide and obtuse, ridged and wrinkled; skin yellow, partly washed with dull light scarlet and often marbled with streaks of russet and inconspicuous capillary-netted russet lines; dots scattering, large and irregular, gray or russet; calyx-tube short, wide, cone-shape, with a fleshy projection of the pistil into its base; stamens marginal; core small, axile, closed; core-lines meeting; carpels broad, narrowing sharply towards the apex, truncate at base, emarginate; seeds numerous, small, plump, acute, compactly filling the cells; flesh yellow, coarse, crisp, tender, juicy, mild, subacid, aromatic; fair to good; November to February.

BOSKOOP. *Belle de Boscoop.* Well grown, Boskoop is a handsome fall apple with considerable merit as a market fruit for culinary purposes. The variety is capricious as to soils, however, and probably is worth planting only in regions where its great hardiness makes it valuable. It is said to have originated from seed planted at Boskoop, Holland, in 1856. The first account of it in America was published in the *Montreal Horticultural Report* in 1881.

Tree large, vigorous, open, wide-spreading and drooping; branches long, stout, crooked, lateral branches numerous and small. Leaves large, broad. Fruit large, oblate, or round-oblate, obscurely ribbed, sometimes with oblique axis, uniform in size and shape; stem short and thick, sometimes long; cavity large, acute, furrowed, often irregular, deep, russeted; calyx large, segments long or very long, acuminate, closed or open, separated at the base; basin abrupt, narrow, shallow to deep, furrowed; skin dull green or yellow, blushed and mottled with red striped with deeper red, roughened with russet flecks, often irregularly overspread with russet; dots small, gray, mingled with others which are large, irregular and russet; calyx-tube large, cone-shape; stamens median; core small, abaxile; cells often unsymmetrical, closed or open; core-lines clasping; carpels round or obcordate, tufted; seeds when well developed long, irregular, obtuse, tufted; flesh yellow, firm, coarse, tender, juicy, crisp, brisk subacid; good to very good; September to April.

BOTTLE GREENING. Bottle Greening holds a place in the list of desirable apples because it can be grown particularly well in northern regions on sandy and gravelly soils, the trees, on such sites, bearing annually and abundantly. The apples are fit for dessert and are excellent for cookery, but, because of tenderness of skin and flesh, are not of much value for the market; they scald badly in cold-storage. Bottle Greening originated as a chance seedling on the dividing-line between New York and Vermont, where it came into fruit nearly a hundred years ago. The original tree was hollow, and workmen found it a convenient place for the "bottle," hence the name. Its culture is restricted to cold regions.

Tree medium in size, vigorous, round and open; branches long, stout, crooked, with yellowish bark. Leaves broad. Fruit medium to large, round-oblate to ovate, sometimes conic, regular, obscurely ribbed, symmetrical, sides sometimes unequal; stem short; cavity acuminate, deep, broad, sometimes lipped, indistinctly furrowed or compressed; calyx large, closed or open; basin abrupt, narrow to wide, often furrowed, sometimes wrinkled; skin thin, tough, smooth, green or yellow, thinly washed or blushed with dull crimson, not striped; dots few, usually submerged, pale and inconspicuous, a few scattering ones are russet; prevailing color green; calyx-tube large, conical; stamens median; core small, abaxile; cells often closed towards apex and open at base; core-lines clasping; carpels broad, round to obcordate; seeds medium, acute; flesh white, firm, tender, very juicy, aromatic, pleasant subacid; good to very good; October to March.

13. Buckingham. (×½)

BUCKINGHAM. Fig. 13. *Fall Queen. Kentucky Queen. Ne Plus Ultra Queen. Red Horse. Winter Queen.* Buckingham is a southern apple, attaining in the South, especially on the Atlantic seaboard, almost perfection in form and color, and having, besides, a rich, pleasant flavor. In the North, the apples do not develop high color nor good quality, and the trees are unproductive and irregular in bearing. The origin of Buckingham is unknown, but it has been grown in Virginia and North Carolina for at least a century and a half.

Tree a moderate grower. Fruit large, oblate to round-oblate, irregular, broadly and obscurely ribbed, sides sometimes unequal; stem stout, short; cavity large, acute to acuminate, wide, deep, with heavy outspreading russet; calyx large, closed or open; basin large, abrupt, wide, deep, obscurely furrowed, wrinkled; skin thick, tough, pale yellow or pale green washed and mottled with red, striped and blushed with bright carmine; dots numerous, small, light or russet, mingled with others which are large, gray and areolar; calyx-tube conical; stamens median; core small, abaxile to axile; cells symmetrical and open or closed; core-lines clasping; carpels concave, elliptical to round, emarginate, smooth; seeds dark, large, plump, wide, obtuse; flesh yellow, firm, coarse, tender, crisp, juicy, with distinct aroma, mild subacid; fair to good; November to April.

BULLOCK. *Bullock's Pippin. Golden Russet.* Bullock was one of the favorite dessert apples of a century ago, and continued in favor until Downing's time. He speaks of it as "one of the most delicious and tender of apples." The fruits are small, and, with their modest russet skins, are not striking enough to attract much attention now, but its rich, spicy, refreshing flavor makes it too good an apple to be wholly lost. It succeeds best in sandy or gravelly soils. Bullock originated in Burlington County, New Jersey, more than a century ago. Its culture is restricted to the seaboard of the Middle Atlantic states.

Tree not large but vigorous, upright or round-topped. Fruit small or medium, round-conic to ovate, regular in outline, uniform; stem long, slender; cavity acuminate, deep, narrow, funnel-shape or compressed; calyx small, closed; basin small, often oblique, shallow, narrow, wrinkled; skin pale yellow, more or less overspread and splashed with thin russet; dots numerous, small, obscure, russet; core large, axile, open; core-lines nearly meeting; carpels round; seeds large, plump; flesh yellow, firm, fine, crisp, very tender, juicy with an agreeable rich, aromatic, mild subacid flavor; very good to best; October to January.

CANADA BALDWIN. Canada Baldwin, an inapt name, is a very late Fameuse, and deserves a place on apple lists in northern regions to extend the season of Fameuse. It is not so attractive in appearance nor so well-flavored as the better-known Fameuse. The variety originated on the farm of Alexis Dery, St. Hilaire, Quebec, about 1850.

Tree upright, becoming open and spreading; branches long, stout. Leaves broad. Fruit medium, round-conic, sometimes oblate, obscurely ribbed, symmetrical, regular; stem pubescent, long, slender, bracted, or more often short and thick; cavity large, acute, deep, broad, smooth or covered with thin russet, often furrowed or compressed, pubescent near base of stem; calyx closed or open, pubescent, with long, acuminate, reflexed lobes; basin shallow, obtuse, often furrowed or compressed, irregularly wrinkled, often with mammiform protuberances; skin thick, tough, smooth, pale yellow, mottled and blushed with bright red, splashed and striped with carmine, conspicuously marked with areolar dots and covered with a thin bloom; dots large, numerous, areolar with russet or gray center; calyx-tube funnel-shape; stamens marginal to median; core closed or partly open; core-lines clasping; carpels smooth, ovate, emarginate, mucronate; seeds large, plump, acute, numerous, narrow, long, smooth or tufted; flesh white, tinged with red, firm, coarse, crisp, tender, juicy, mild subacid, pleasant; good or very good; November to January.

CANADA RED: See Red Canada.

CANADA REINETTE. *Canada Pippin. White Pippin.* This variety, supposed to have originated in Canada, is not well thought of on this side of the Atlantic, being excelled by many similar sorts, but is highly esteemed in Europe. In America, the apples lack in quality and the trees are unproductive. The origin of the variety is not definitely known; it was first described in France in 1786.

Tree vigorous, spreading and drooping; branches long, stout, crooked. Leaves broad. Fruit variable in size, frequently very large, oblate or roundish, inclined to conic, often irregularly, broadly angular, sometimes with furrows extending from base to apex, not uniform in shape; stem short; cavity acute, broad, wavy, sometimes russeted; calyx large, closed or partly open; basin abrupt, deep, wide, furrowed and wrinkled; skin yellow, sometimes with a blush, not striped, marked with dots, flecks or irregular patches of russet; calyx-tube wide, cone-shape; stamens median or basal; core medium, abaxile to axile, open or partly so; core-lines meeting; carpels round, inclined to obovate, tufted; seeds few, large, long, tufted, dark; flesh yellow, firm, tender, coarse, breaking, juicy, subacid; very good; early winter until March or April.

CANNON. *Cannon Pearmain.* Cannon is an old southern apple, valued as a long-lived sort, which first appeared in pomological literature in 1851 with the statement that it originated in Virginia or North Carolina. It is still grown in the South Atlantic states.

Tree healthy, vigorous, spreading. Fruit medium to large, ovate varying to roundish, regular, symmetrical, uniform; skin greenish-yellow, mottled and washed with bright red faintly striped with carmine; dots yellow, often areolar with russet point; core medium, axile, closed; core-lines clasping; flesh yellow, firm, coarse, crisp, juicy, aromatic, subacid; good; January to April.

CARPENTIN. *Carnation. Gray Reinette.* The fruit of Carpentin is handsome, pleasantly flavored, red-russet, not larger than the well-known Lady, and most suitable for dessert. The origin of the variety is unknown, but it was first described in America by Downing in 1872. It is little grown and deserves wider recognition in home orchards.

Tree vigorous, with long slender shoots. Fruit small, uniform in size and shape, round-conic to oblate, regular and symmetrical, occasionally with sides unequal; stem very long, slender; cavity large, acuminate, deep, broad, symmetrical, often with concentric broken russet lines; calyx small, closed; lobes short, broad, obtuse; basin abrupt, shallow, narrow, smooth or sometimes furrowed, symmetrical, marked with concentric broken lines of russet; skin thick, tough, dull yellow or with bright blush, partly smooth but more or less netted with cinnamon-russet; dots scattering, gray; calyx-tube small, short, narrow to wide, conical; stamens basal; core axile, medium, often closed; core-lines meeting, clasping; carpels elliptic to round or broadly ovate, emarginate; seeds dark, wide, short, obtuse to broadly acute; flesh white, sometimes with red tinge next the skin, very firm, fine, crisp, tender, very juicy, subacid, brisk, strongly aromatic, high in flavor; very good; December to April.

CARSON. Nurserymen and fruit-growers in Indiana speak very highly of Carson as an extra early variety, and believe that it has commercial possibilities. The variety is said to be a seedling of Summer Rose; it originated with a Mr. Carson near Indianapolis, Indiana, about 1906, and was introduced by C. M. Hobbs & Son, Bridgeport, Indiana, in 1915. The following description is compiled from nursery catalogs:

Tree upright, straight-limbed, very vigorous, bearing early, annually and heavily, without tendency to blight. Fruit medium to large, from one-third to one-half larger than Yellow Transparent, round-oval, yellow, overlaid

with streaks and blotches of bright pinkish-carmine; flesh white, crisp, juicy, tart, aromatic; quality good for either dessert or culinary purposes; one week before Yellow Transparent.

CHAMPLAIN. *Haverstraw Pippin. Large Golden Pippin. Nyack. Sour Bough. Summer Pippin. Tart Bough.* Champlain has many qualities that commend it for the home orchard. The apples are attractive in color, good in quality, and ripen throughout a long period. The trees are vigorous, hardy, healthy, long-lived, and productive. The origin of the variety is unknown but it has been on record since 1853, when an account of it was published in the *New England Farmer.* Its culture is almost wholly confined to New England and the Middle Atlantic states. It is more often known as Nyack or as Summer Pippin than as Champlain.

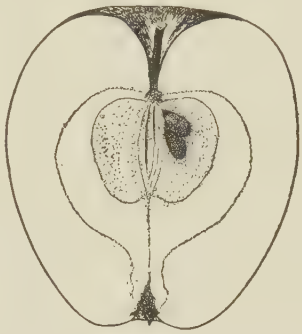
Tree medium to large, vigorous, upright-spreading, open, with long stout branches. Fruit medium to large, un-uniform in size or shape, round-conic to ovate or oblong, irregularly ribbed, sides unequal; stem medium to long; cavity acuminate, shallow, narrow, sometimes furrowed and usually russeted; calyx small, closed or open; basin shallow, narrow, abrupt, smooth; skin tender, pale yellow, often with a light crimson blush; dots numerous, small, russet or submerged; calyx-tube conical, usually short but sometimes elongated; stamens median; core large, axile to abaxile; cells open; core-lines clasping; carpels smooth, elongated-ovate; seeds dark brown, narrow, short, plump, sharp-pointed, acuminate; flesh yellow, fine, very tender, juicy, sprightly, subacid; good to very good; late August to October.

CHARLAMOFF. *Arabka. Pointed Pipka.* Charlamoff is a Russian variety of the Oldenburg type, suitable for the cold climate of the northern parts of the Great Plains and Canada. It ripens a little earlier than Oldenburg, but is not so good in quality, and has the fault of remaining in good condition for only a short time. To offset these faults of the fruit, the trees come in bearing young and yield large crops biennially. It was introduced from Europe about 1880.

Tree rather small, compact, very hardy, spreading, productive, bearing biennially. Fruit of medium size, sometimes large, oblong-conical; skin pale yellow, splashed and streaked with purplish-red; dots few, distinct; cavity deep, of medium width; stem medium long, stout; basin shallow, wrinkled; calyx open; flesh white, coarse, juicy, mildly subacid, pleasant; quality good; August or just before Oldenburg.

CHENANGO. Fig. 14. *Chenango Strawberry.* In its season, Chenango is the apple of apples in taste, smell, and appearance. The fruits begin to mature in September and continue to ripen for several weeks, lasting, in storage at least, until November. Chenango is too delicate to send to market, but no apple can give more pleasure to those who grow fruit for quality. The trees are early and regular bearers, hardy, healthy, long-lived, fruitful, and usually annual in bearing. Unfortunately, the history of this delicious apple is not known, but it probably originated in Madison or Chenango County, New York. It was first described in 1854. Its merits quickly brought it into culture in the apple regions of the whole country, and it now grows in the orchard of nearly every amateur apple-grower.

Tree of medium size, vigorous, upright-spreading, dense, with short, stout, curved branches. Fruit medium to large, elongated-ovate or oblong-conic, ribbed; stem short, thick; cavity acuminate, deep, narrow, often furrowed and compressed; calyx large, partly open or closed; lobes often separated at the base, long, broad,



14. Chenango (×½)

obtuse; basin small, shallow, narrow, obtuse, furrowed, sometimes wrinkled; skin tough, smooth, glossy, yellowish-white, overspread and mottled with pinkish-red, conspicuously striped and splashed with carmine; dots few, inconspicuous, light-colored, often submerged; calyx-tube long, funnel-shape; stamens median; core large, abaxile; cells often unsymmetrical, wide, open or closed; core-lines clasping; carpels broadly ovate, smooth; seeds small, wide, plump, obtuse; flesh white, firm, tender, juicy, mild subacid, very aromatic; good to very good; latter part of August and through September.

CLAYTON. The tree-characters of Clayton are satisfactory, but the fruits are but mediocre in size, color, and quality, their chief merit being good keeping and shipping qualities. It is grown chiefly in the Middle West, more particularly in the Ozark region of southwestern Missouri. Clayton was first described by Warder in 1867. The origin is given as Indiana.

Tree vigorous, upright-spreading, open; branches long, stout. Leaves large. Fruit large, round-oblate to round-conic; stem medium, often obliquely set under a prominent, fleshy lip; cavity acute to obtuse, deep, broad, often furrowed, usually with conspicuous outspreading russet; calyx small, open or closed; basin abrupt, medium in width and depth, symmetrical, often wrinkled; skin thick, tough, smooth, yellow, blushed and mottled with dull red, with splashes and stripes of carmine, often marked with gray scarf-skin near the cavity; dots medium, pale or russet, scattering; calyx-tube long, narrow, funnel-shape; stamens marginal; core abaxile; cells usually unsymmetrical, open; core-lines clasping; carpels concave, elliptical, emarginate; seeds numerous, dark, small, plump, obtuse; flesh yellow, firm, coarse, crisp, mild subacid; good; January to May or June.

COLLAMER. This variety is a sport of the well-known Twenty Ounce, from which it differs in bearing fruits more solidly covered with red, more regular in shape, and less ribbed. The brighter color of Collamer makes it a more valuable commercial apple than Twenty Ounce. The variety originated at Hilton, New York, in the orchard of J. B. Collamer, about 1895. For a technical account of fruit and tree, the reader is referred to Twenty Ounce.

COLLINS. *Champion. Champion Red. Collins Red.* Collins is receiving attention in

regions where Ben Davis thrives. The fruit is somewhat like that of Baldwin in shape and color, with a cavity like that of Rome Beauty. The trees have a high reputation for vigor and productiveness. In the North, the fruit is much inferior in appearance and quality to Baldwin, and it is not equal to Rome Beauty or even Ben Davis in these respects in the South. Collins originated about 1865 near Fayetteville, Arkansas.

Tree large, tall, very vigorous, upright and dense, eventually becoming open; branches long, thick, crooked. Leaves large, long. Fruit large, globular or oblate inclined to conic, symmetrical; stem medium to short; cavity acute, sometimes acuminate, broad, symmetrical or obscurely furrowed, smooth or with radiating russet rays; calyx small, open or sometimes closed; lobes separated at the base, short, obtuse; basin round, deep, abrupt, symmetrical or furrowed; skin thick, tough, waxy, with faint bloom, bright dark red, indistinctly striped with purplish-carmine and occasionally showing contrasting clear yellow ground color; dots inconspicuous, russet or pale gray; sometimes a suture line extends from cavity to basin; calyx-tube small, long, narrow funnel-shape to short-conic; stamens median; core small, abaxile; cells symmetrical, closed or open; core-lines clasp the funnel cylinder; carpels concave, elliptical to obcordate, tufted and deeply emarginate; seeds dark, large, narrow, long, flat, acute; flesh white, very firm, coarse, crisp, tender, juicy, sprightly subacid, aromatic; fair to good; January to June.

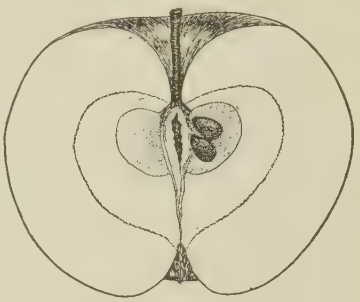
COLTON. *Early Colton.* The tree of Colton is thrifty, hardy, and productive, and comes into bearing young, but the fruit is not good enough in quality to make the variety valuable, although it is much grown in parts of the Middle West. Colton originated in Franklin County, Massachusetts, about 1840 on the farm of a Mr. Colton.

Tree large, vigorous, upright when young but eventually spreading, with long, stout, crooked branches. Fruit medium in size, round, narrowing toward both ends, ribbed; stem medium in length, stout; cavity small, acute, shallow, narrow; calyx closed, with long, recurved lobes; basin small, shallow, obtuse, wrinkled; skin pale yellow, sometimes with a shade of red; dots numerous, large, green; calyx-tube elongated, funnel-form; stamens median; core large, abaxile; cells open; core-lines clasping; carpels broadly round; flesh white, coarse, crisp, juicy, mild subacid; fair to good; last of July to early September.

COLVERT. Colvert is grown in some localities to compete with Twenty Ounce, to which, however, it is usually inferior in size, color, and quality of fruit. The trees are quite as good as those of Twenty Ounce, being hardy, healthy, and productive. The origin is uncertain, but it is an American sort and was first described by Warder in 1867.

Tree large, vigorous, upright-spreading, open; branches long, curved, crooked. Leaves broad. Fruit large, uniform in size but variable in shape, oblate to oblate-conic, obscurely ribbed, irregular and with sides unequal; stem short, thick; cavity acute, deep, medium in width, usually heavily russeted, sometimes compressed and frequently lipped; calyx closed or open; lobes short, narrow, acuminate; basin abrupt, medium in depth, narrow, furrowed; skin thick, tough, dull greenish-yellow, sometimes partly washed with red and striped and splashed with carmine; dots inconspicuous, usually submerged, a few scattering ones are large and russet; prevailing color greenish-yellow; calyx-tube broadly conical; stamens median; core axile, small; cells closed or partly open; carpels broad-cordate, emarginate, tufted; seeds large, wide, long, plump, acute, frequently abortive; flesh yellow, firm, coarse, crisp, tender, juicy, subacid; good; October to January.

CONSTANTINE. Fig. 15. *Grand Duke Constantine.* Constantine is very similar to the better-known Alexander, from which it differs in that the fruit ripens a week later, keeps longer, hangs later, cracks less, and is a little better in quality. The trees are not so large as those of Alexander and may be planted more closely. The origin of Constantine is uncertain. It was first described in Europe in 1873, in America in 1880 in the *Iowa Horticultural Society Report.*



15. Constantine. (×½)

Tree small, at first vigorous but becoming a slow grower, spreading, open, with short, stout, curved branches. Fruit very large, round-conic to oblate-conic, regular or ribbed, symmetrical; stem medium to long, slender to thick; cavity large, acuminate, very deep, broad, symmetrical, russeted and with outspreading rays of greenish-russet; calyx open; lobes medium in width and length, acute; basin narrow, abrupt, smooth or wrinkled; skin thick, tough, smooth, waxy, greenish-yellow, mottled, marbled and blushed with bright red over nearly the whole surface, with wide broken stripes of carmine radiating from the cavity, overspread with thin bloom; dots white or pale russet; prevailing effect bright red; calyx-tube long, wide, funnel-shape; stamens median; core of medium size, abaxile; cells open or closed; core-lines clasping; carpels broadly ovate or cordate, emarginate; seeds medium in size, wide, short, thick, plump, obtuse, dark brown; flesh white, firm, coarse, tender, juicy, sprightly subacid; fair to good; late September to November.

COOPER MARKET. *Cooper's Red.* For nearly a century Cooper Market was a standard commercial apple in northern regions. Its chief merits are capacity to keep, attractive color and form in the fruit, and vigor, hardiness, healthfulness, and productiveness in the trees. The variety is now passing from cultivation because the apples are small and their quality is poor. The variety is thought to have originated in Pennsylvania. It was first described in 1804.

Tree vigorous, upright, lateral branches long, slender and drooping. Fruit medium or large, round-ovate to round-conic, flattened at the base and often narrowing sharply towards the apex, symmetrical; stem long, slender; cavity acuminate, deep, narrow, sometimes furrowed, often russeted; calyx small, closed, pubescent; basin small, often oblique, shallow, narrow, obtuse, furrowed, wrinkled; skin tough, smooth, glossy, greenish-yellow, mottled and blushed with red, conspicuously splashed and striped with bright carmine and covered with light bloom; dots white or with a russet point, numerous and small towards the cavity, scattering, large and irregular towards the basin; calyx-tube small, short, cone-shape; stamens median; core distant, truncate, abaxile, medium; cells closed or open, often unsymmetrical; core-lines clasping; carpels round, emarginate, tufted; seeds numerous, dark, short, plump, acute; flesh

yellow, very firm, coarse, tender, juicy, brisk subacid; fair to good; January to June.

CORTLAND. The fruits of Cortland are so similar to those of McIntosh that the two varieties are certain to be confused, but each is distinct and the differences are all in favor of Cortland so that the apple is better than that of McIntosh, impossible as it may seem. The fruits of Cortland ripen a little later than those of McIntosh, keep longer, are larger, and brighter in color. The shape, taste, and flesh-characters of the two are almost identical. The trees are much the same. Cortland is an improved McIntosh and as such is sought for in New York and New England where McIntosh is chiefly grown. The variety is a cross between Ben Davis and McIntosh made at the New York Agricultural Experiment Station in 1898. The variety was distributed in 1915 and now promises to be a close competitor or to take the place of McIntosh where the latter is grown.

COX ORANGE. *Cox's Orange Pippin.* Beautiful to sight and delicious in taste, Cox Orange is one of the choicest of apples. Unfortunately, though the fruits attain the same perfection here as in Europe, the trees in America are unthrifty and unfruitful on standard stocks, and must be given special care on a dwarfing stock. The variety is said to have originated in 1830 from seed of Ribston, at Colnbrook Lawn, Bucks, England. Introduced in America as early as 1850, it is as yet found but sparingly on the Atlantic seaboard.

Tree medium or above, vigorous, upright, thickly branched, dense, with slender branches. Leaves small and narrow. Fruit medium or large, uniform in size and shape, round-oblate, sometimes conic, regular or faintly ribbed, symmetrical, axis sometimes oblique; stem obliquely inclined, short, thick, sometimes long; cavity obtuse, shallow, narrow, often russeted; calyx small, closed or open; basin shallow and obtuse to deep and abrupt, narrow, smooth or furrowed; skin thin, tough, smooth, washed with orange-red deepening to bright red and mottled and splashed with carmine over a deep yellow background; dots conspicuous, large, areolar with pale gray or russet center; calyx-tube cone-shaped; stamens median; core of medium size, abaxile; cells usually symmetrical, open or closed; core-lines clasping the funnel cylinder; carpels thin, obovate to obcordate, emarginate, smooth; seeds reddish-brown, large, wide, obtuse, often abortive; flesh yellow, firm, fine, crisp, tender, very juicy, rich, sprightly subacid, aromatic; very good to best; late September to January.

CRANBERRY PIPPIN. The large size, bright color, uniform shape, good keeping qualities, and pleasant flavor of the fruit, with hardiness of tree and resistance to scab, make Cranberry Pippin an excellent apple for some localities. Unfortunately the trees do not bear young in some situations, and are capricious in bearing at all times, so that its local adaptabilities should always be determined before planting. Cranberry Pippin originated near Hudson, New York, sometime previous to 1845, when Downing first set forth its merits. Its culture is confined to New York, New England, and the adjoining parts of Canada.

Tree large, vigorous, upright-spreading; branches stout. Leaves dark green, large. Fruit large, round-oblate, symmetrical; stem short; cavity broad, wavy; calyx closed or open; basin deep, russeted; skin smooth, shining, light yellow, blushed, striped and splashed with scarlet; dots many, large, often red-areolar with russet center; flesh yellow, juicy, mild subacid; good to very good; October to February.

DEACON JONES. The fruits of Deacon Jones are of large size and when well colored are handsome, the yellow ground-color being overlaid with an attractive red, relieved with numerous prominent dots. The apples hang exceptionally well to the tree, there is almost no waste from windfalls and culls, and they are uniform in size and shape. The quality is much better than that of Ben Davis, but hardly as good as that of Baldwin. A tough skin and firm texture make the apples good shippers. The tree in nursery and in orchard is most thrifty, comes into bearing young, is very productive, and is an annual bearer. The variety originated in Pennsylvania some time previous to 1890. It is now grown only in New York.

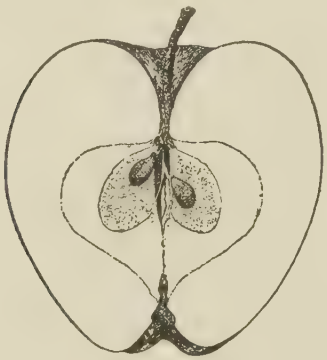
Tree vigorous, upright-spreading; branchlets willowy, long, slender, drooping. Fruit large to very large, uniform in size, round-conic to oblong-conic, ribbed, axis sometimes oblique; stem short; cavity obtuse, shallow to deep, smooth, often prominently lipped; calyx small, closed or partly open, often leafy; lobes sometimes separated at the base; basin shallow to deep, usually narrow, distinctly furrowed and wrinkled; skin thick, tough, smooth or rough, waxen yellow, mottled and blushed with red and with irregular dashes of carmine, in highly colored specimens deep red, with a bloom which gives the fruit a dull appearance; dots conspicuous, small and large, white, many areolar with russet point, numerous toward the eye; calyx-tube variable in size, urn-shape; stamens median; core abaxile; cells symmetrical, wide open, very large; core-lines meeting; seeds numerous, small, dark brown, plump, obtuse, irregular; carpels much tufted, emarginate, mucronate, elongated and broadly ovate; flesh yellow, firm, coarse, crisp, tender, juicy, mild subacid, aromatic; fair to good; November to March.

DEADERICK. *Ozark Pippin.* Deaderick is a large apple with a pleasing commingling of yellow and green, making it rather more handsome than Rhode Island Greening, which it much resembles. The apples are inferior to those of Rhode Island Greening in quality, and do not keep so well. In Tennessee and other parts of the South, it is looked on with favor as an early winter apple. The variety originated in Washington County, Tennessee, about 1890, on the farm of Benjamin Ford.

Tree vigorous, spreading, upright. Leaves narrow; often the base of the petioles is conspicuously streaked with red. Fruit large, round, often conical, sometimes broadly ribbed, regular, uniform; stem long, slender; cavity large, acute, deep, broad, smooth and symmetrical, sometimes furrowed, occasionally lipped; calyx small, open or closed; lobes narrow, acute; basin small, shallow, obtuse, abrupt, smooth, wrinkled; skin thick, tough, smooth, yellow usually partly covered with a thin pinkish-red blush upon which are red, areolar dots with russet or whitish centers; commonly the dots are white and often submerged; prevailing color green or yellow; calyx-tube long, funnel-form; stamens median; core abaxile, small; cells symmetrical, open; core-lines clasping the base of the cylinder; carpels thin, smooth, broadly round, narrowing toward the base, emarginate; seeds numerous, large, wide, obtuse; flesh yellow, firm, coarse, tender, juicy, pleasant subacid; good; October to January.

DELICIOUS. Fig. 16. *Stark Delicious.* A few years ago, Delicious created a sensation in fruit-growing circles. Probably no new apple of recent times has been more widely

talked about, more generally planted, or better received by consumers and growers alike. Introduced in 1895, in the short time that has intervened, its culture has spread throughout the apple districts of the United States. In the orchards of the West and Northwest, it has been extensively planted and, according to all reports, is proving a commercial success. All who have tasted the apple agree that its rich, distinctive flavor is its chief asset, although it has size and beauty as well. Contrary to the usual behavior of apples, the fruit of this variety seems to increase in size and color as the trees grow older. The variety was found in 1881 by Jesse Hiatt, Peru, Iowa. Stark Brothers, Louisiana, Missouri, introduced it in 1895.



16. Delicious. (×½)

Tree large, vigorous, spreading, hardy, productive; branches smooth, stout. Leaves large, thick, dark green. Fruit large, uniform, roundish-conic to oblong-conic, ribbed; stem long, medium thick; cavity deep, broad, often furrowed, flaring, greenish; calyx medium, nearly closed, with long, narrow, acute lobes; basin moderately deep, wide, abrupt, very strongly furrowed and corrugated; skin very thick, tough, smooth; color light yellow, nearly to almost entirely overspread with dark, attractive red, splashed and mottled with carmine; dots numerous, small, yellow; core medium in size, axile, closed with clasping core-lines; calyx-tube long, wide funnel-shaped; seeds of medium size; flesh yellowish, firm, a little coarse, tender, juicy, aromatic, pleasant subacid; good to very good; December to last of February.

DETROIT RED. *Detroit Black.* Several apples have been grown under the name Detroit Red, but since none is of much value, and all are passing from cultivation, it is not worth while to attempt to straighten out the nomenclatorial tangle. The description below makes the identification of the true Detroit Red an easy task. This old and unique variety is suppose to have been grown and disseminated by French settlers near Detroit nearly two centuries ago.

Tree large, upright-spreading or roundish. Fruit large, oblate-conic to round-oblate, often strongly ribbed, irregular; stem short, slender; cavity very large, acute, deep, broad to very broad, frequently compressed, usually thinly russeted; calyx variable, large, closed or open; lobes short, broad, obtuse; basin medium in width and depth, obtuse, irregularly furrowed and wrinkled and often with mammiform protuberances; skin thick, tough, dark crimson, striped and splashed with carmine becoming almost black, sometimes having a portion of the greenish-yellow ground color exposed; dots numerous, conspicuous, very small, pale or russet; calyx-tube short, wide, broadly conical; stamens median; core round, flat, tufted; seeds large, plump, obtuse, light brown; flesh white, streaked or stained with red, coarse, tender, juicy, mild subacid, very aromatic; good to very good; last of September to December.

DICKINSON. Dickinson is a seedling of Yellow Bellflower; the fruits of the offspring resemble those of the parent in shape and size, but are red instead of yellow. Though productive, the trees are otherwise of poor habit, and the quality of the fruit is second rate. The variety was grown from seed at West Chester, Pennsylvania, by Sarah Dickinson, about 1875, and has been rather widely disseminated throughout the United States.

Tree small, round-spreading, dense; branches short, stout, crooked. Leaves broad. Fruit medium to large, somewhat variable in size, oblong-conic, sometimes compressed or broadly angular, sides sometimes unequal; stem medium to long; cavity broad, deep, acuminate, symmetrical or sometimes compressed, smooth; calyx closed or sometimes open; basin shallow to deep and abrupt, often oblique, somewhat furrowed and wrinkled; skin smooth, light yellow or green, blushed and mottled with bright red, striped with darker red, sprinkled with inconspicuous, small, green and white dots; prevailing effect red; calyx-tube funnel-form; stamens median to basal; core large, abaxile; cells open; core-lines clasping; carpels round-oblong; seeds numerous, large, plump, obtuse; flesh juicy, fine-grained, aromatic, subacid, firm, tender; fair to good; November to April.

DOCTOR. The fruit of this variety is well-colored, satisfactory in size and shape, and of about the same quality as that of the Baldwin. The tree is but moderately vigorous, and not above the average in other characters, thus bringing the variety down to mediocrity. Doctor originated in Germantown, Pennsylvania, about 1800.

Tree vigorous, open and spreading. Leaves broad. Fruit medium to large, uniform in size and shape, oblate, symmetrical, angular; stem short; cavity acute, deep, wavy, sometimes lipped; calyx large, open; lobes long, acute; basin variable, obtuse to abrupt, often wide, deep, ridged and wrinkled; skin smooth, waxen yellow, with a bright red blush, indistinctly marked with narrow carmine splashes; dots green or gray; prevailing effect red and yellow; calyx-tube large, short, urn-shape to truncate funnel-form; stamens basal; core small, abaxile; cells usually symmetrical, open or sometimes closed; core-lines meeting or somewhat clasping; carpels smooth, broadly elliptical, quite concave; seeds medium in size, wide, obtuse; flesh yellow, firm, coarse, crisp, tender, juicy, mild subacid, aromatic; good to very good; December to April.

DR. MATTHEWS. Fruit-growers in Indiana speak very highly of Dr. Matthews, a comparatively new apple in that state. The variety has the seal of approval of the Indiana Experiment Station and of the Indiana Horticultural Society. The two characters which seem to distinguish the fruit are high quality and length of season, the variety ripening in August or September and keeping until April. The origin of Dr. Matthews is in doubt, but it has been grown since 1899 in the orchards of the Indiana Experiment Station, where it was received from an unknown source in a shipment of nursery stock. The variety is described in circular 74 of the Indiana Experiment Station as follows:

"Size medium, uniform; shape roundish oblate, regular, sides slightly unequal, uniform; color dull yellowish

green, blushed and washed with bronze red, prevailing effect yellowish green; skin thin, tough, smooth, dull, waxen; dots pronounced, numerous, large to small, more numerous at basin, submerged, areolar; cavity acuminate, deep, medium width, sometimes slightly russeted, often compressed; stem medium length, slender, pubescent, green; basin medium to deep, medium width, abrupt, smooth, tendency to be compressed; calyx open to partly closed, large; lobes long, leafy, acute, narrow; calyx-tube conical, short, wide; stamens basal; core medium, lines clasping, axile; cells symmetrical, closed; carpels elliptical, mucronate; seeds medium sized, long, plump, acute, dark brown; flesh firm, fine, crisp, tender, cream white, juicy, very mild, subacid, sprightly, aromatic, very good to best; use dessert; season, harvested last of August, storage to February. Tree large, upright spreading, dense, very vigorous, healthy."

DOMINE. *English Red Streak.* Domine is one of the choicely good apples rapidly passing from cultivation, but still to be found in many old orchards. The apple is commonplace in color and size, but the quality is good, its juiciness and sprightliness making it one of the most refreshing of fruits, while, at the same time, it is rich in flavor. The tree, unfortunately, is not very productive, and its branches break easily when heavy crops do set. The origin of Domine is uncertain, but it has been grown in America at least since 1820, its culture being confined for the most part to the Middle Atlantic states.

Tree vigorous, upright-spreading, with long, spreading branches. Leaves long, drooping and characteristically twisted. Fruit medium, sometimes large, oblate, sometimes oblong and distinctly flattened at the base, sides often unequal, ribbed; stem medium to long, slender; cavity obtuse, wide, deep, often furrowed, usually with outspreading brown-russet rays; calyx closed or open; lobes long, acute; basin pubescent, shallow to deep, wide or compressed, abrupt, usually furrowed; skin thick, tough, smooth, bright, yellow or green mottled and splashed with deep pinkish-red, striped with bright carmine and overlaid with thin bloom; dots pale, numerous toward the basin, toward the cavity scattering, large, irregular and with russet center; calyx-tube funnel-shape with a wide limb and short truncate cylinder; stamens median; core small, abaxile; cells symmetrical, closed or partly open; core-lines meeting or clasping; carpels broadly elliptical, emarginate; seeds numerous, large, plump, narrow, long, acute, dark; flesh yellow, firm, breaking, coarse, tender, juicy, mild subacid with a peculiar aromatic flavor; good to very good; November to March.

DUCHESS OF OLDENBURG: See Oldenburg.

DUDLEY. *Dudley's Winter. North Star.* By virtue of hardiness and productiveness, Dudley deserves a place in orchards in northern localities. The fruit is of the type of Oldenburg. The variety is not desirable except where hardiness is a determinant. Dudley is a seedling of Oldenburg, grown by J. W. Dudley, Castle Hill, Maine, having been first described in 1891.

Tree small, vigorous, spreading and drooping, dense; branches short, stout. Fruit large, uniform, round-conic or round-oblate, symmetrical; stem long, thick; cavity acute, deep, broad, sometimes russeted, obscurely furrowed; calyx large, open or partly closed; basin abrupt, deep, broad, obscurely furrowed, wrinkled; skin thin, tender, smooth, pale yellow covered with a bright red blush, striped and splashed with carmine and covered with light bloom; dots scattering, light, small; prevailing color red striped over yellow; calyx-tube long wide, funnel-shape; stamens median; core axile; cells closed or partly open; core-lines clasping; carpels broadly elliptical, tufted; seeds large, wide, long, flat, obtuse, dull dark brown; flesh yellow, firm, crisp, fine-grained, tender, very juicy, aromatic, brisk subacid becoming mild; very good; September and October.

DUTCH MIGNONNE. This once valued general-purpose apple has served its day and is passing from cultivation, disappearing chiefly because the apples are unattractive and not quite good enough in quality. The trees are vigorous and in alternate years productive. The history of this old-time worthy goes back to 1771—it was probably grown long before that date—when it was imported from Holland to England; thence to America about 1800.

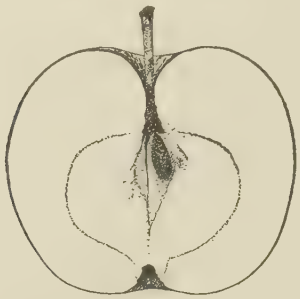
Tree vigorous, wide-spreading, dense; branches short, stout, curved. Leaves broad. Fruit large, uniform in size, round-oblate, sometimes conic, often elliptical and broadly ribbed; stem often characteristically long and slender and obliquely inserted; cavity acute, deep, broad, often with outspreading russet rays and faint lines and flecks of dull gray scarf-skin, furrowed or sometimes compressed, occasionally lipped; calyx small, closed or open; basin shallow, wide, often furrowed and wrinkled; skin yellow with thin orange blush, in highly-colored specimens deepening to orange-red, mottled and sparingly splashed or striped with carmine; dots numerous, white or russet, often areolar; prevailing effect dull orange-yellow; calyx-tube large, long, conical; stamens marginal; core axile, small, closed; core-lines clasping; carpels broadly roundish, flat, emarginate; seeds few, often long, irregular, flat, obtuse or acute; flesh yellow, firm, fine, crisp, tender, juicy, subacid, sprightly, good for dessert; excellent for cooking; often extending to May.

DYER. *Golden Spice. Pomme Royale. White Spice.* The creamy white, half transparent flesh—tender, crisp, aromatic, sprightly, and rich—make the fruit of Dyer the quintessence of the apple-orchard. The color—greenish yellow with a delicate blush of red—makes it a handsome fruit as well. Unfortunately this fine apple cannot be enjoyed often nor in quantity, nor by many, as the trees bear only biennially, and are not fruitful, vigorous, healthy, or hardy. The name, Dyer, was given the fruit about sixty years ago, but the variety was cultivated during the Revolutionary War, and is supposed by some to be the old French sort, Pomme Royale. Its culture is confined to the East and Middle West.

Tree vigorous in the nursery, dwarf in the orchard; comes in bearing young, but is short-lived; productive biennially. Fruit medium or sometimes large, round-oblate, regular or obscurely ribbed; stem long, slender; cavity small, acute, deep, sometimes lipped; calyx small, closed; lobes long, recurved; basin small, shallow to deep, furrowed; skin smooth, pale yellow, more or less flecked and marbled with a brownish blush on one cheek; dots dark or russet; core of medium size; cells open or closed; core-lines clasping; seeds numerous, plump, short, small, pale; flesh yellow, fine, very crisp, tender, aromatic, sprightly, mild subacid, highly flavored; very good to best; September and October.

EARLY HARVEST. Fig. 17. *July Pippin. Tart Bough. Yellow Harvest. Yellow Juneating.* As the earliest summer apple, and because the fruit is excellent for either dessert or cooking, Early Harvest should hold a welcome place in every home collection. Much of the fruit is too small to be marketable, and the apples bruise badly in handling, so that the variety is suitable only for nearby markets. The trees are above the average in vigor, productiveness, hardiness, and healthfulness. Early

Harvest was described as long ago as 1806, and is probably of American origin.



17. Early Harvest. (×½)

Tree medium size, moderately vigorous, upright-spreading or roundish, open. Fruit medium, sometimes large, uniform in size and shape, oblate to nearly round, regular or slightly angular; sides unequal; stem medium in length, thick; cavity acuminate, shallow, narrow to broad, russeted, with outspreading, broken russet rays; calyx small, closed; lobes long, narrow; basin shallow, wide, obtuse, wrinkled; skin thin, tender, smooth, clear pale waxen yellow, with deeper yellow on exposed cheek, sometimes slightly blushed; dots numerous, large and small, submerged or russet; calyx-tube short, funnel-shape; stamens median; core medium, abaxile; cells closed or slightly open; core-lines clasping; carpels obovate; seeds small to large, narrow, long, plump, acute; flesh white, fine, crisp, tender, juicy, at first briskly subacid but becoming mild; good to very good; late July and August.

EARLY JOE. The rarest and richest essence of the apple is to be found in the fruits of Early Joe; their crisp, tender, juicy, aromatic, richly-flavored flesh is universally liked. Unfortunately the tree is among the "unmanageables," being slow of growth, attaining only medium size, seldom fruitful, and producing many undersized and otherwise unmarketable apples. Early Joe grew from a seed planted in 1800 by Heman Chapin, East Bloomfield, New York.

Tree vigorous, flat, spreading, dwarfish with short, stout, crooked branches. Fruit small, uniform in size and shape, oblate-conic to conic, ribbed, symmetrical; stem long, slender; cavity acute, shallow, broad, symmetrical, sometimes thinly russeted; calyx closed or slightly open; basin small, shallow, medium in width, abrupt, smooth or wrinkled; skin thin, tender, smooth, pale yellow, irregularly and obscurely striped and splashed with dull, dark red, in highly colored specimens deeply blushed on the exposed cheek; dots russet, white; calyx-tube wide, broadly conical; stamens median; core small, axile; cells open or closed; core-lines clasping; carpels broadly obcordate, concave; seeds small, wide, short, obtuse; flesh yellow, fine, crisp, very tender, very juicy, mild subacid; very good to best; August to September.

EARLY RIPE. Early Ripe has little to commend it other than thriftiness and productiveness of tree. The apples, while of quite sufficient size, are not uniform in size or shape, and are not good enough in quality to rank with a half score of other August apples. It was first described by Warder in 1867, and probably originated in Pennsylvania, in which state it is chiefly to be found.

Tree large, vigorous, upright-spreading, dense; top roundish, with long stout branches. Fruit medium to large, uniform in size but not in shape, round-oblate, sometimes conic, irregular, broadly ribbed; stem often bracted, medium in length or short, thick; cavity acute, shallow, broad, sometimes russeted; calyx small, closed; basin obtuse, very shallow, wide, somewhat wrinkled; skin light yellowish-green; dots numerous, small, pale gray or russet; calyx-tube narrow, funnel-form; stamens median; core large, abaxile; cells closed or partly open; core-lines clasping; carpels broadly roundish, emarginate; seeds plump, obtuse; flesh white, firm, coarse, crisp, tender, juicy, brisk subacid, becoming mild subacid; fair to good; August.

EARLY STRAWBERRY. *Red Juneating.* Early Strawberry is a favorite August apple. It merits the esteem bestowed on it by virtue of fruits with crisp, tender, sprightly, aromatic flesh; and hardy, healthy, early-bearing, fruitful trees. The apples are too delicate to ship, and a high percentage of them are undersized and malformed, so that the variety is not a good general market sort. Early Strawberry was first known in what is now the City of New York, where it probably originated about 1800 or a little later. It is now widely distributed in eastern America.

Tree medium in size, moderately vigorous, upright-spreading, hardy, healthy, coming in bearing young, moderately productive biennially. Fruit medium, uniform in shape and size, round-conic or round, regular or somewhat ribbed, sides often unequal; stem long and slender, often clubbed; cavity acute, deep, broad, symmetrical, sometimes with faint radiating rays of russet; calyx small, closed or open; lobes long, narrow; basin small, shallow, narrow, obtuse, furrowed; skin thick, tough, smooth, waxy, yellow, covered with rich dark red, mottled and irregularly striped and splashed with deeper red; dots minute, grayish; calyx-tube short, wide, conical with fleshy pistil point projecting into the base; stamens median; core large, axile or abaxile; cells open, sometimes partly closed; core-lines meeting; carpels elliptical, concave, emarginate; seeds wide, plump, obtuse, dark brown; flesh yellow often with streaks of red, coarse, crisp, tender, juicy, subacid, aromatic, sprightly; very good; August.

ENGLISH RUSSET. *Winter Russet.* English Russet is preëminent among apples because its fruits keep latest of all—often from one season until the next. There is little else to extol, since the fruits are not good in quality, attractive in color, nor even up to medium size. The tree falls below the mark in the several essentials of a good apple-tree. The day of English Russet passed with the advent of cold storage. The variety is often confused with Golden Russet, from which it may be easily distinguished if their descriptions be closely compared. Despite its name, this is an American apple from southeastern New York, first described in 1845.

Tree large, upright. Fruit small, uniform in size and shape, round, inclined to conic, regular and symmetrical, sometimes faintly ribbed; stem slender, medium in length, often streaked on one side with brownish-red, usually not exserted; cavity acute to acuminate, narrow, deep, symmetrical or compressed, occasionally lipped; calyx small, usually open; segments long, acute and reflexed; basin abrupt, deep, narrow, symmetrical; skin tough, varies from pale green to yellow more or less covered with russet, the base often entirely russeted; dots inconspicuous, round or irregular, dark russet; calyx-tube narrow, cone-shape; stamens basal; core small, abaxile; cells symmetrical, open, sometimes closed; core-lines meeting; carpels flat, round to broad-ovate, tufted; seeds numerous, plump, narrow, acute to acuminate, light brown, sometimes tufted; flesh yellow, firm, crisp, tender, fine-grained, aromatic, pleasant, mild, subacid; good; January to May.

ENSEE. About 1900, Ensee, introduced by U. T. Cox, Rockwood, Ohio, created something of a sensation in the horticultural press and in horticultural societies. It seemed especially worthy of trial because of the good keeping qualities of the fruit, and the early bearing and productiveness of the trees. After twenty years of probation, however, it is now almost wholly discarded except in Ohio, but two or three nurserymen in the country offer it, and there is but little demand for the trees. On the grounds of the New York Agricultural Experiment Station, the apples are similar to those of Rome, differing chiefly in being a little darker in color. The tree-characters of Rome seem to be somewhat better than those of Ensee, which fact, no doubt, accounts for the falling off in the demand for the newer variety.

18. Esopus Spitzenburg. (×½)

ESOPUS SPITZENBURG. Fig. 18. *Esopus.* Esopus Spitzenburg is one of the leading American apples. The fruits are unexcelled in quality, and are most pleasing in appearance. The flavor is subacid, rich, spicy, and aromatic. The color is a commingling of light and dark red laid on a rich yellow background with a dark red blush on the cheek to the sun, the whole surface being sprinkled with yellow and russet dots contrasting well with the red. The apples range from medium to large in size; are beautifully formed in an oblong-conic mould; and are sufficiently uniform in size and shape to make this an ideal apple for fancy packages. The apples are about the best to eat out of hand, and very good for all culinary purposes as well; they withstand well all the usages of marketing and keep in cold storage until June. They are found in nearly every large market on the continent in season, often under the *sobriquet* "Spitz." Esopus Spitzenburg, however, falls considerably below the mark of perfection through lack of vigor and health in the tree, and because of decided local prejudices to soil and climate which make it suitable only to favored localities. Unfortunately, also, blossom, foliage, and fruit are inviting prey to apple-scab. The variety originated in Esopus, New York, some years previous to 1800, and has long been grown from the Atlantic to the Pacific.

Tree open and spreading, upright, the lateral branches slender and drooping. Leaves narrow. Fruit medium to large, uniform in size and shape, broad and flat at the base, varying from oblong to conic, obscurely ribbed; stem medium; cavity acuminate, deep, wide, red or yellow or with outspreading rays of thin yellowish-russet; calyx small, closed or open; basin often oblique, abrupt, narrow, shallow, sometimes compressed, furrowed and wrinkled; skin tough, waxy, roughened by the russet dots, deep rich yellow covered with bright red, inconspicuously striped with darker red, marked with pale yellow and russet dots numerous toward the basin, larger and much elongated toward the cavity; calyx-tube elongated, cone-shape; stamens median; core large, abaxile; cells often unsymmetrical and open but sometimes closed; core-lines clasping; carpels large, round-ovate, mucronate, tufted; seeds large, long, wide, acute, dark shaded with light brown; flesh yellow, firm, fine, crisp, tender, juicy, aromatic, sprightly subacid; very good to best; November to February.

FALLAWATER. *Tulpahocken.* The fruits of Fallawater are unique, easily recognized by their large size, globular form, and, in well-colored specimens, the unbroken pinkish-red color on a yellow background. The flesh is coarse, without distinctive flavor. The season is more or less variable. The tree characters are usually very satisfactory, though productiveness is sometimes a fault, causing branches to break. Fallawater is at least a century old, having originated in Bucks County, Pennsylvania; it was taken by pioneers from its native state to the Middle West, where it is still widely cultivated.

Tree large, vigorous, upright. Fruit large to very large, globular, sometimes oblate, symmetrical, sometimes slightly irregular and faintly ribbed, uniform in size and shape; stem very short; cavity acuminate, deep, narrow, somewhat furrowed; calyx large, closed or open; lobes variable; basin shallow to deep, abrupt, sometimes furrowed, wrinkled; skin tough, smooth, waxy, often dull grass-green with dull blush, highly colored specimens yellow and blushed with bright deep red, often streaked with thin grayish scarf-skin; dots conspicuous, white, areolar with russet point; calyx-tube wide, short, cone-shape; stamens basal; core abaxile to axile, large; cells unsymmetrical, open or closed; core-lines meeting or clasping; carpels tufted, long, narrowly ovate, mucronate; seeds few, long, narrow, acuminate, tufted; flesh yellow, firm, coarse, crisp, tender, juicy, subacid to mildly sweet; fair to good; November to March or April.

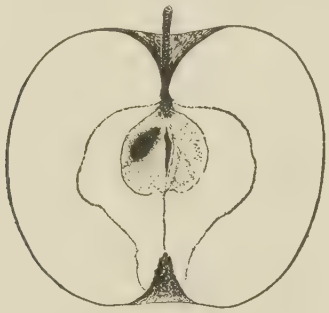
FALL JENNETING. The fruit of this old variety was at one time highly esteemed, but there are now many better sorts of its season. The tree is so remarkable for its vigor, size, health, and longevity that the variety should be a good parent to breed from. Connecticut is given as the habitat of the original tree, which first fruited more than a century ago.

Tree large, vigorous, spreading or roundish. Fruit large, round-oblate inclined to conic, ribbed at the base, sides unequal; stem short, thick; cavity acuminate, deep, wide, symmetrical, with outspreading rays of russet; calyx large, closed or open; lobes long, narrow, acute, reflexed; basin small, shallow, narrow, furrowed and wrinkled; skin thin, tough, smooth, pale yellow with faint brownish-red or bronze blush; dots numerous, inconspicuous, sometimes russet but more often white and submerged; prevailing effect yellow; calyx-tube long, narrow funnel-shape; stamens median; core small, axile to abaxile; cells symmetrical, closed; core-lines clasping; carpels round to broadly ovate; seeds light brown, small, narrow, plump, acute; flesh yellow, firm, fine, crisp, tender, juicy, sprightly, subacid; good; late September to December.

FALL ORANGE. *New York Bellflower.* The fruits of Fall Orange are scarcely good enough for dessert and are so readily bruised in handling that they are not suitable for

market. Several rivals in season surpass it. The origin of the variety is given as Holden, Massachusetts, and the date as previous to 1848. Its culture seems to be confined to New England and New York.

Tree vigorous, hardy, healthy, long-lived, productive biennially. Fruit large, uniform in size but not in shape, round-conic, irregular; stem short, slender; cavity acute, deep, regular or compressed, often russeted and with outspreading russet rays; calyx large, open or closed; basin uneven, one side projecting higher than the other, deep, wide, abrupt, furrowed; skin pale yellow sometimes with brownish blush; dots numerous, large and small, russet or red, areolar; calyx-tube large, long, conical with fleshy point projecting into the base, the lower part of the funnel cylinder sometimes enlarged; stamens median; core small, axile; cells symmetrical; core-lines meeting when the tube is short, clasping when it is long; carpels elliptical to cordate; seeds not numerous, dark brown, plump, obtuse; flesh white, fine, crisp, tender, juicy, subacid, aromatic; very good; late September to early winter.



19. Fall Pippin. (×½)

FALL PIPPIN. Fig. 19. *Autumn Pippin. Pound Pippin. Summer Pippin. York Pippin.* Though one of the oldest American apples, it is doubtful whether Fall Pippin is properly appreciated. The name is inapt, as in the North the fruit keeps well into mid-winter, and is of first rate quality to the very last. The color is a beautiful golden yellow, and the flesh is tender, rich, crisp, aromatic, and of delectable quality either for dessert or for culinary uses. The trees are hardy, healthy, long-lived, and very large; few trees carry a more majestic port at maturity. Unfortunately, tree and fruit are most inviting prey to the apple-scab fungus; this accounts for the neglect into which the variety fell a generation ago, but, with means of controlling the scab, its culture should be renewed. The habitat of the variety is New England, where it has been grown for at least a century and a half.

Tree large, very vigorous, spreading, with long branches which become drooping. Fruit large or very large, uniform in size and shape, round to round-oblate, inclined to conic, sometimes oblong and truncate, often obscurely ribbed; stem long, thick; cavity acute, wide, symmetrical or compressed, russeted; calyx large, open; lobes separated at the base, long, narrow, acuminate; basin wide, abrupt, wavy, wrinkled; skin thin, smooth, clear yellow, sometimes faintly blushed; dots numerous, small, pale and submerged or russet; calyx-tube large, wide, long, conical; stamens median; core medium size, abaxile; cells symmetrical, closed or partly open; core-lines meeting or clasping; carpels round, emarginate, tufted; seeds dark brown, acute, plump; flesh yellow, firm, fine, tender, very juicy, agreeably subacid, aromatic; very good; late September to January.

FALL WINE. *Musk Spice. Ohio Wine. Sweet Wine. Wine.* At one time noted for its excellent fruits, Fall Wine has practically passed into oblivion. Except for the high quality of its product, the variety is but mediocre. Fall Wine is reported to have originated in Albany, New York, in 1832.

Tree of medium size, vigorous, healthy, long-lived, productive biennially. Fruit large, round-oblate, ribbed, sides often unequal; stem long; cavity obtuse, wide, deep, sometimes lipped; calyx small, closed or partly open; lobes long, narrow, reflexed; basin deep, wide, abrupt, furrowed; skin yellow washed with red which on the exposed cheek deepens to a bright blush, indistinctly striped with carmine; dots yellowish-brown or russet; calyx-tube long, narrow, funnel-form; stamens median; core medium, axile; cells symmetrical, closed or open; core-lines clasping; carpels broadly roundish, tufted; seeds wide, acute; flesh yellow, tender, juicy, aromatic, very mild subacid; fair to good; September to January.

FAMEUSE. Fig. 20. *Snow.* Few apples are more beautiful and more refreshing than those of Fameuse. If the tender skin of light and shaded red be cut through, flesh of snowy whiteness rimmed and stained with crimson is exposed, beautiful to sight and delectable to smell and taste. Fameuse, commonly and aptly called Snow, belongs to Canada and the high altitudes and northern latitudes of the United States, where, alone, the apples reach perfection, and the trees attain vigor, health, and longevity. The variety has several serious faults; thus, the apples are small and keep only until Christmas; fruit and tree are inviting prey to apple-scab; and the trees are very fastidious as to soils. Fameuse is of Canadian origin, with a history of at least 200 years. It is the parent of a score or more of worthy offspring.

20. Fameuse. (×½)

Tree vigorous, upright-spreading, dense, with long, stout branches. Fruit medium size, round-conic, sometimes oblate, regular, uniform, symmetrical; stem medium to short, sometimes long, slender; cavity acute, deep, wide, often gently furrowed, sometimes russeted but generally smooth and red or green; calyx small, closed; basin medium in width and depth, abrupt, obscurely furrowed or wrinkled, often having mammiform protuberances; skin thin, tender, smooth, bright red deepening to dark red in highly-colored specimens, striped toward the apex; dots few, scattering, light; calyx-tube narrow, funnel-form; stamens median; core small, axile; cells closed; core-lines clasping; carpels symmetrical, round or elliptical, emarginate, mucronate; seeds dark, long, narrow, acute; flesh white, streaked or stained with red, very tender, juicy, subacid becoming mild subacid, aromatic; very good; October to midwinter.

FAMILY. Family has little to recommend it excepting its long period of ripening—a valuable attribute in a fruit for home use. It

originated some time before the Civil War in Georgia, where alone it is of value as a summer apple. Farther north, it is a fall or even an early winter fruit.

Tree vigorous, upright-spreading, with short, stout branches. Fruit small, round-oblate to round-conic, faintly ribbed, symmetrical, sides often unequal, uniform in shape and size; stem long, slender; cavity acuminate, deep, narrow, symmetrical, sometimes lipped; calyx open; lobes long and reflexed; basin shallow, narrow, abrupt, narrowly furrowed; skin thin, tough, smooth, mottled and washed with red over a pale yellow ground, shading to deep dark red in the sun, marked with many narrow and broken stripes of dull purplish-carmine, sprinkled with conspicuous pale yellow or russet dots and overspread with white bloom; calyx-tube long, wide, funnel-form, often extending to the core; stamens median to basal; core abaxile, large; cells symmetrical and wide open; core-lines clasping; carpels concave, broad-elliptical; seeds numerous, large, acute to obtuse, plump; flesh yellow, sometimes tinged with red near the skin, firm, crisp, fine-grained, tender, juicy, sprightly subacid becoming mild, pleasant in flavor; good; October to January.

FANNY. The fruits of Fanny are beautiful and most excellent in quality, and the trees are very satisfactory; but the apples are so deficient in size and ripen over so long a period that the variety is of value only for the home orchard. Fanny originated at Lancaster, Pennsylvania, with Dr. John K. Eshelman, previous to 1869, when Downing called attention to its merits.

Tree vigorous, flat, spreading, open, with long, stout branches. Fruit medium size, uniform in size and shape, round-oblate, oblong or ovate, regular or slightly ribbed; stem short, slender; cavity acute, medium in width and depth, sometimes russeted; calyx small, closed or partly open; lobes short, narrow, acute; basin shallow, wide, abrupt, furrowed; skin thin, tender, smooth, yellow overlaid with bright red indistinctly striped with carmine; dots small, yellow; calyx-tube wide, funnel-form with pistil point projecting into the base; stamens median; core below medium, abaxile; cells open; core-lines clasping; carpels broadly ovate, emarginate; seeds large, wide, flat, plump, acute; flesh yellow, firm, fine, very tender, juicy, mild subacid; good to very good; September to November or later.

FLORY. *Flory Bellflower. Flora Belle.* Flory is an apple of the type of Yellow Bellflower, to which it is inferior in nearly all characters. It originated in Montgomery County, Ohio, previous to 1872, when it was first described by Downing. It is now grown only in the Middle West, usually under the name Flora Belle.

Tree vigorous, upright-spreading. Fruit medium to large, ovate to round-conic, often ribbed, symmetrical; stem slender; cavity acuminate, symmetrical, sometimes lipped; basin medium in width, deep, abrupt, somewhat furrowed; calyx closed or open; lobes narrow and acute; skin tough, clear yellow, becoming deeper yellow, roughened with capillary-netted russet lines and russet dots; calyx-tube conical, sometimes meeting the core; stamens median; core large, abaxile; cells symmetrical, partly open to wide open; core-lines meeting; carpels long, ovate; seeds numerous, often irregular in form, small to large, wide, obtuse, dark brown; flesh yellow, firm, hard, coarse, juicy, agreeably subacid; good in quality; October.

FLUSHING SPITZENBURG. *Black Spitzenburg. Flushing.* This old variety, still grown but passing into deserved oblivion, has had its career prolonged by an inapt name which has caused it to be confounded with Esopus Spitzenburg. The apples are poor in quality, and the trees are seldom fruitful. Nothing is known of the early history of Flushing Spitzenburg, but it has been cultivated since 1800, when it was first described.

Tree large, vigorous, round-headed or spreading. Fruit medium to large, round-conic or sometimes oblate-conic, obscurely ribbed, symmetrical; stem short; cavity acuminate, deep, narrow, smooth and red or greenish; calyx small, closed or open; lobes broad, obtuse; basin narrow and shallow, obtuse, sometimes furrowed and wrinkled; skin tough, yellow, overspread with orange-red, becoming bright deep red on the exposed side, coated with light bloom; dots conspicuous, white; calyx-tube long, funnel-form, extending to the core; stamens median; core distant, abaxile with a wide hollow cylinder at the center, nearly axile; cells symmetrical, partly open or closed; core-lines clasping; carpels round, wide, mucronate, emarginate, somewhat tufted; seeds dark, large, wide, plump, acute, sometimes tufted; flesh yellow, sometimes streaked with red, firm, coarse, crisp, juicy, mild subacid; good in quality; October to February.

GANS. See Black Ben Davis.

GARDEN ROYAL. Garden Royal is a very good home variety for late summer and early autumn, but the apples are too small and the season is too short for commercial value. The fruits are regular in form and handsomely colored a deep yellow striped with orange-red and dark crimson—a most prepossessing apple. The flesh is very tender and aromatic and has a pleasant acid flavor. The variety originated at Sudbury, Massachusetts, over a century ago. Its cultivation is confined to New England and New York.

Tree of medium size, vigorous, round-headed, hardy, healthy, long-lived, comes into bearing young and is reliable in biennial bearing. Fruit small, round or oblate-conic, regular or obscurely ribbed; stem short, straight, slender; cavity acute, deep and broad, furrowed, often russeted; calyx small, open or partly closed; lobes separated, short, acute; basin wide, shallow, obtuse, wrinkled; skin thin, greenish-yellow, sometimes entirely overspread with red, irregularly striped and splashed with carmine; dots numerous, conspicuous, often irregular, russet or yellow; calyx-tube funnel-shape; stamens median; core small, axile; cells closed or slightly open; core-lines clasping; carpels small, elliptical, emarginate; flesh yellow, fine, tender, juicy, agreeable, mild subacid, aromatic; very good; late August and September.

GIDEON. *Gideon White.* The clear waxen yellow color, heightened by a bright pinkish blush, makes the fruits of Gideon beautiful; but the quality is not good, and the flesh passes rapidly from maturity to decay. The greatest assets of the variety are hardiness, vigor, and fruitfulness. It is of value only where less hardy varieties cannot be grown. Gideon was grown by Peter Gideon, Excelsior, Minnesota, about 1880 from a seed of a crab-apple which was thought to have been fecundated by pollen of Blue Pearmain.

Tree medium to large, vigorous, upright becoming spreading and open. Fruit medium to large, uniform in size, round-conic or ovate, sometimes oblong, angular; stem long, slender; cavity acute, deep, broad, sometimes russeted; calyx small, closed; lobes narrow, acute, reflexed; basin small, sometimes oblique, shallow, narrow, obtuse, wrinkled, usually with narrow ridges; skin thin, glossy, waxen yellow, with pink blush on exposed cheek; dots light, submerged, inconspicuous, except where the skin is blushed; calyx-tube short, narrow, often funnel-shape with very short, truncate cylinder; stamens marginal; core axile or abaxile; cells closed or open; core-lines meeting the limb or clasping the cylinder; carpels round, broadly ovate, or elliptical.

emarginate, tufted; seeds large, irregular, long, acute, tufted, light brown; flesh yellow, soft, coarse, crisp, juicy, subacid; fair to good; October.

GIDEON SWEET. Gideon Sweet is a variety of the Blue Pearmain group so closely resembling Bethel that the two are sure to be generally confounded. The essential differences are that the flesh of Bethel is whiter and more often tinged with red, not so sweet nor so high in quality, and the skin is redder. In both varieties the stem is characteristically curved. The variety originated with Peter Gideon, Excelsior, Minnesota, about 1880. Its hardiness fits it for northern latitudes, where, alone, it is worth cultivating.

Tree vigorous, wide-spreading, dense; branches short, stout, crooked. Fruit large, round to conic, often oblate, broadly and obscurely ribbed, sides sometimes unequal; stem long, curved; cavity broad, acuminate, deep, indistinctly furrowed, often with green or red-russet rays; calyx small, closed or open; lobes long, acuminate; basin shallow, broad, obtuse, furrowed, wrinkled; skin tough, rough towards the apex, deep yellow or green mottled and blushed with orange-red sometimes irregularly splashed and striped with carmine and overspread with thin bloom; dots conspicuous, yellow or russet, scattering; calyx-tube large, broad, conical; stamens median to basal; core irregular, abaxile; cells often unsymmetrical, open or closed; core-lines meeting or clasping; carpels roundish, tufted; seeds medium to large, light brown, narrow, acute, tufted; flesh yellow, firm, crisp, coarse, juicy, aromatic, sweet; good to very good; November to April.

GILPIN. *Carthouse. Red Romanite. Romanite.* Gilpin has a place in the South, where it is chiefly grown, by virtue of its long-keeping fruits. The apples hang on the tree until heavy frosts, and suffer little by moderate freezes, often remaining in good condition under leaves or rubbish throughout the winter. The tree-characters are all good. The apples are too small and hardly high enough in quality to make the variety generally desirable. The birthplace of the variety is Virginia, and its history dates back at least to the Revolution, though the earliest account of it is given by Coxe in 1817.

Tree vigorous, round, open, spreading with short and drooping laterals. Fruit small, uniform in size and shape, round to ovate-truncate, sometimes nearly cylindrical, often obscurely ribbed, symmetrical or sides unequal, sometimes oblique; stem short; cavity acuminate, usually deep, broad, obscurely furrowed or compressed, sometimes lipped, often russeted; calyx large, open, rarely closed; lobes leafy, reflexed, long, acuminate; basin oblique, deep, wide, abrupt and prominently furrowed but sometimes shallow and narrow or compressed, wrinkled; skin tough, smooth, glossy, greenish-yellow becoming deep yellow, with brownish-red cheek often deepening to dark red; calyx-tube wide, short, truncate-funnel-shape; stamens basal; core axile; cells symmetrical, closed or open; core-lines meeting or clasping; carpels round to ovate, narrowing towards apex, mucronate, emarginate; seeds numerous, dark brown, large, plump, acute, tufted; flesh yellow, very firm, coarse, at first hard but becoming crisp and tender, juicy, subacid; good; February to June.

GLADSTONE. Relationship to Oldenburg and Gravenstein is immediately apparent in the fruit of Gladstone, the apples resembling the latter more than the former. The variety, however, is hardly equal to either in quality of fruit or in tree-characters. It is of comparatively recent introduction in America, but has been grown for half a century in England.

Tree small, vigorous, spreading or drooping, with short, stout branches. Fruit medium to large, uniform, round-oblate, sometimes conic, obscurely ribbed, sides usually unequal; stem medium in length, slender; cavity acuminate, wide, deep, sometimes with outspreading russet; calyx large, closed or open; basin small, medium in depth and width, abrupt, furrowed and wrinkled; skin thin, smooth, pale yellow, thinly overspread with red, irregularly mottled, splashed and distinctly striped with carmine; dots numerous, inconspicuous, light colored, submerged; calyx-tube short, cone-shape; stamens median; core large, usually axile; cells symmetrical, closed or open; core-lines clasping; carpels broadly roundish, emarginate; seeds dark brown, very wide, flat, obtuse; flesh yellow, firm, coarse, crisp, tender, juicy, mild subacid; fair in quality; September and October.

GLORIA MUNDI. *American Mammoth. Pound.* Gloria Mundi is of interest because its fruits are the largest of cultivated apples, fit, however, only for culinary uses. All that is known of its history is that it was cultivated in the states of the Northeast very generally before 1804, since which time it has been widely distributed in the United States and Canada.

Tree large, vigorous, spreading, hardy, long-lived, but not very productive. Fruit large, uniform, round with truncate ends, conical, ribbed, sides usually unequal; stem short, thick; cavity large, acuminate, deep, broad, furrowed and compressed, sometimes russeted; calyx large, open or partly closed; lobes separated at base, short, narrow; basin large, deep, wide, abrupt, sometimes with faint bronze blush; dots small, often areolar with russet center, or light colored and submerged; prevailing effect yellow; calyx-tube very large, long, wide, broadly conical extending to core; stamens median; core large, usually abaxile; cells symmetrical, open; core-lines usually clasping; carpels broadly roundish to elliptical, tufted; seeds dark brown, small, narrow, short, plump, obtuse, sometimes tufted; flesh yellow, coarse, crisp, tender, juicy, mild subacid; fair or good in quality; October to January.

GOLDEN DELICIOUS. There are no yellow dessert apples of first rate in America, fruit or tree of all failing in one character or another. Golden Delicious is now being introduced for this place—as a cosmopolitan yellow dessert apple—with the expectation that it will rank with the best red apples. Judged by its fruit-characters, the expectations of the introducers may be realized, for no other yellow apple is handsomer and of better quality, nor possesses better shipping and keeping characters. It is too soon to speak with confidence of the trees, but it seems certain, from their behavior in many widely separated regions, that they are hardy, vigorous, healthy, and productive, with no marked faults that have appeared as yet. The variety was given the Wilder Silver Medal by the American Pomological Society in 1920. Golden Delicious originated as a chance seedling in West Virginia in the orchard of A. H. Mullins about thirty years ago, and was introduced by Stark Brothers, Louisiana, Missouri, in 1916.

Trees hardy, vigorous, healthy, productive. Fruit large, 1¼ inches broad, 1¾ inches long, oblong-conic, uniform in size and shape, symmetrical, distinctly ribbed; stem 1½ inches long, slender, curved; cavity acuminate, broad, very deep, smooth, gently furrowed; calyx large, closed; basin narrow, abrupt, furrowed; skin golden yellow, thin, smooth; dots numerous, small, conspicuous, russet and submerged at the apex; core large, open, abaxile; core-lines distinct, clasping; calyx-tube long, wide, funnel-shaped; carpels round-oval, tufted; seeds large, plump, acute; flesh firm, crisp,

tender, juicy, mild subacid, rich, aromatic; quality very good to best for dessert and cooking; autumn to May.

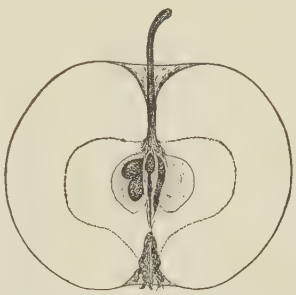
GOLDEN PIPPIN. *Butter Pippin. Pound Royal.* This name is applied to several quite distinct apples, of which the one here described is much the most important. A comparison of the descriptions will show that this variety is very similar to Fall Pippin, and that it is suitable for the same uses, adapted to the same regions, and has the same faults. The essential differences between the two are that in this sort the apple is a little coarser in size, texture of flesh, and flavor, but keeps longer, ships better, and has an even more vigorous and hardy tree. The origin of Golden Pippin is unknown, but it dates back a century at least. Its culture is confined to New York.

Tree large, spreading, hardy, vigorous, healthy, long-lived and reliable in bearing. Fruit large, uniform in size and shape, round to round-oblate, sometimes conic, often with a broad, flat base and broadly ribbed toward the apex; stem long, thick, sometimes swollen; cavity acute, medium in depth, broad, usually symmetrical, sometimes lipped, russeted and often with heavy, outspreading russet rays; calyx large, closed; basin deep, wide, abrupt, furrowed, sometimes irregularly compressed; skin tender, green or yellow when mature, sometimes with bronze blush and russet flecks; dots large and conspicuous, green, submerged or with russet point; calyx-tube wide, conical; stamens median; core small, abaxile; cells open; core-lines meeting or clasping; carpels round or elliptical, sometimes obovate, heavily tufted; seeds few, often not perfectly developed, medium size, irregular, dark brown, plump, acute; flesh yellow, coarse, tender, juicy, mild subacid, aromatic; good to very good; September to January.

GOLDEN RUSSET. The fruits of Golden Russet are not large, but they are smooth, uniform, suffer little from pests, and are most excellent for dessert, culinary uses, evaporating, and, of all varieties, best for cider. Besides, they keep and ship very well. The trees are hardy, vigorous, and usually fruitful. Among russet apples, Golden Russet ranks second only to Roxbury. There is much confusion in names of the russet apples, but a careful reading of the descriptions will keep one straight. Golden Russet is at least a century old in America, but when and from where it came is not known.

Tree large, vigorous, upright-spreading, dense; branches long, stout, with long, slender laterals which become drooping. Fruit medium to large, round-oblate to conic, sometimes elliptical, sometimes obscurely angular, smooth, uniform in shape and size; stem short to very short, stout; cavity wide, acuminate, often deep green with numerous paler green or grayish dots; calyx large, closed or open; lobes long, acute, often reflexed, sometimes separated at the base; basin oblique, round, abrupt, shallow, sometimes plaited or ribbed; skin thick, tender, sometimes with patches and flecks of russet, more often covered with green- or yellow-russet, becoming golden russet with bronze cheek; dots gray or russet, inconspicuous on the smooth skin; calyx-tube short, wide, conical; stamens basal; core medium, abaxile, or having a wide, hollow cylinder for the axis; cells often unsymmetrical, open; core-lines meeting; carpels broadly-ovate, elongated, sometimes tufted, slightly emarginate if at all; seeds light brown with a red tone, small, plump, obtuse, sometimes tufted; flesh yellow, fine-grained, crisp, tender, juicy, rich, subacid, aromatic; very good; December to April.

GOLDEN SWEET. Fig. 21. *Golden Sweeting. Orange Sweet. Yellow Sweeting.* Golden Sweet is a standard early variety for home use. The fruits are surpassed by those of few other sweet apples in richness and sweetness of flavor; while of only medium size, they are very attractive in appearance, being uniform in size and shape and having a handsome clear yellow color. The variety is at least a century old, probably from Connecticut, but now grown in all apple regions.



21. Golden Sweet. (×½)

Tree large, vigorous, spreading or drooping, dense. Fruit large, uniform in size and shape, round, round-oblate or ovate, regular or faintly ribbed; stem very long, thick; cavity acute, of medium depth and width, symmetrical, usually partly russeted, often with outspreading russet rays; calyx small, closed; lobes narrow, acute; basin shallow, narrow, obtuse, smooth, symmetrical, furrowed; skin thin, tender, smooth, waxy, pale yellow; calyx-tube medium in width, cone-shape; stamens median; core small, abaxile; cells often unsymmetrical, open; core-lines clasping the funnel cylinder; carpels ovate; seeds small, narrow, angular, acute, brown; flesh yellow, firm, fine-grained, tender, juicy, very sweet, aromatic; good to very good; mid-August to late September.

GRANDMOTHER. *Bogdanoff. Red Reinette.* Grandmother was imported from Russia about 1880 and widely distributed for trial in the northern states. It has the usual merits and faults of Russian apples, and is not above the average in any of its characters.

Tree large, vigorous, spreading, flat, open, with long stout branches. Fruit large, ovate to round-conic, flat at base, angular, sides unequal, fairly uniform; stem short, thick; cavity acute, narrow, deep, shallow or scarcely depressed, much russeted and often with outspreading russet; calyx large, closed; lobes broad, acute; basin deep, wide, abrupt, usually furrowed and wrinkled; skin smooth, greenish-yellow, with faint blush; dots numerous, inconspicuous, light and submerged, or areolar with dark center; calyx-tube medium in length, wide, broadly conical; stamens basal; core small or abortive, axile or abaxile; cells symmetrical, usually closed; core-lines meeting; carpels variable, irregular, broadly ovate or obovate, emarginate, tufted; seeds large, dark brown, plump, obtuse; flesh yellow, firm, coarse, very juicy, subacid to brisk subacid, aromatic; fair to good; November to January.

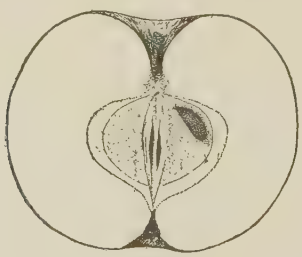
GRAVENSTEIN. Fig. 22. In America, all lovers of fruits value Gravenstein for its crisp, tender, sprightly, juicy, richly-flavored, aromatic apples. It is a valuable commercial fruit, where it succeeds, by reason of early bearing, productiveness, and good shipping qualities. The trees are vigorous but quite subject to sun-scald and apple-canker, and do not hold their load well. Unfortunately, it is fastidious as to both soil and climate, and is

grown in highest perfection in but few localities. Nova Scotia, where it becomes a winter apple, seems best suited to its needs. Gravenstein is an old German apple which has been in America probably a hundred years or more; it was described as early as 1824.

22. Gravenstein. (×½)

Tree large, vigorous, upright-spreading, open. Fruit large, uniform in size but not in shape, oblate or round, somewhat irregular, broad at the base, angular, narrow to broad, irregularly russeted; calyx large, open or closed; lobes large, long, very broad, acute; basin irregular, wide, obtuse to abrupt, wrinkled; skin thin, tender, rough, greenish-yellow or orange-yellow overlaid with broken stripes of light and dark red; dots few, small, light; prevailing effect yellow striped; calyx-tube large, conical; stamens median; core medium in size, strongly abaxile; cells open; core-lines clasping the funnel cylinder; carpels broad-ovate, emarginate; seeds large, long, plump, acute, brown; flesh yellow, firm, fine, crisp, tender, juicy, sprightly subacid, aromatic; very good to best; late September till early November.

GREEN NEWTOWN. Fig. 23. *Albemarle. Albemarle Pippin. Green Newtown Pippin. Mountain Pippin. Newtown Pippin. Yellow Newtown.* Unfortunately, this apple can be grown in perfection only in certain regions, as: Hood River, Oregon; the Albemarle region, Virginia; and along the Hudson River, New York. By virtue of high quality, long-keeping and beauty of fruit, together with good



23. Green Newtown. (×½)

tree-characters, Green Newtown has high standing in regions where it thrives. Experiments at the Experiment Station, Geneva, New York, show that it is a most excellent apple to use in breeding. Green Newtown is preëminently an American apple. The original tree came into bearing early in the eighteenth century, and the variety was soon widely grown. In 1759 samples were sent to Benjamin Franklin in England, where they attracted much attention; John Bartram, the Quaker botanist, soon after sent grafts to England; and Thomas Jefferson was growing the variety at Monticello in 1778. Some pomologists maintain that there is a Yellow Newtown, a distinct variety from Green Newtown; but the differences in color are due to differences in soil or climate—two varieties do not exist.

Tree moderately vigorous, of medium size, spreading or roundish, dense. Fruit medium to large, uniform in size but variable in form and coloring, usually round-oblate and more or less angular, with an oblique axis, sometimes elliptical; stem medium or short; cavity deep, acuminate, broad or compressed, often with rays of russet; calyx small, closed or nearly so; lobes small, acute; basin medium in width and depth, furrowed and often wrinkled; skin tough, smooth or roughened with brownish-russet dots, grass-green at fruit harvest but yellow later, often showing brownish-pink especially near the base; dots submerged, numerous toward the eye, white scarf-skin over the base; calyx-tube long, funnel-shape; stamens median; core small, abaxile; cells symmetrical, closed; core-lines clasping; carpels broadly roundish or round-obcordate, emarginate, tufted; seeds tufted, dark, narrow, acuminate; flesh yellow, firm, crisp, tender, fine-grained, juicy, sprightly, with a fine aromatic subacid flavor; best; February to May.

GREEN SWEET. *Green Sweeting. Honey Sweeting.* The fruits of this excellent variety remain crisp and juicy until spring: from apple harvest to apple blossoming, it is a delicious sweet apple either for dessert or culinary uses. The fruits run small, with the result that there is usually much loss from culls, as there is also from dropping. The tree is unique in its upright, compact growth, and in bearing fruit close to the branches on short laterals and spurs. The variety probably originated more than a century ago in New England, where it is still chiefly grown.

Tree large, vigorous, compact, erect or round-topped; branches stout, young branches dark green. Fruit medium, sometimes large, ovate to round-conic, sometimes obscurely ribbed, regular and uniform in size; stem long, slender; cavity furrowed, deep, acuminate, broad, smooth or open; lobes leafy, long, acute; basin variable, medium in width and depth, abrupt, wrinkled and more or less obscurely furrowed; skin green, becoming yellow, with a thin brownish-red blush; dots green or with fine russet point, often submerged and white; prevailing color green; calyx-tube wide, cone-shape; stamens median; core large, abaxile, open; core-lines clasping or meeting; carpels round-ovate; seeds numerous, small, narrow, acute; flesh greenish-white, tender, fine-grained, juicy, very sweet; good; December to April or May.

GREENVILLE. *Winter Maiden Blush.* Greenville is a seedling of the well-known Maiden Blush, which it much resembles, differing chiefly in bearing winter instead of fall apples. The tree is a heavy and an annual bearer, a light crop usually alternating with a heavy one. It is a good winter apple, but quite destitute of any characters that would make it stand forth preëminently. The variety originated on the farm of Jason Downing, Darke County, Ohio, in 1874, and its culture is confined to its native state.

Tree vigorous, upright-spreading. Fruit medium to large, round-oblate to round-oblong, symmetrical but sometimes irregular or obscurely ribbed, uniform in shape; stem short; cavity acute, deep, wide, symmetrical, sometimes furrowed, sometimes lipped, often russeted; calyx closed or open; lobes often long, acuminate; basin shallow, usually furrowed and wrinkled; skin tough, waxen, pale yellow with a red blush; calyx-tube narrow, funnel-form; stamens median; core medium, abaxile; cells closed or partly open; core-lines

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clasping; carpels broadly roundish; seeds large, light brown, narrow, acute; flesh yellow, firm, crisp, fine, tender, juicy, pleasant, mild subacid, sometimes astringent; good; November to February, sometimes extending into April.

24. Grimes Golden (×½)

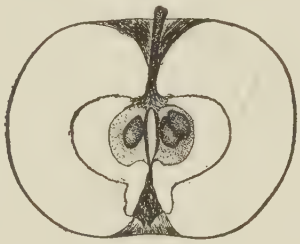
GRIMES GOLDEN. Fig. 24. *Grimes. Grimes Golden Pippin.* In spite of several faults, Grimes Golden is a universal favorite wherever it can be grown. The outstanding merits of the fruits are: beautiful rich golden color, well-moulded form, firm but crisp and tender flesh, pleasantly acidulous flavor, and most pleasant aroma. Unfortunately, except in the Virginias and adjoining states, the variety has many faults. Thus, the apples do not develop size, color, or quality elsewhere than in a few regions, and, wherever grown, they scald badly in storage. The trees, too, are but moderately vigorous, and under most conditions must be classed with the "unmanageables." Grimes Golden originated in West Virginia more than a century ago; its culture is confined to the regions named, and Indiana, Illinois, and Missouri.

Tree vigorous, upright-spreading, drooping, dense; branches short, stout, curved, crooked. Fruit medium to large, round-oblong, often flattened at the ends, sometimes conic, regular, sometimes obscurely ribbed; sometimes oblique, symmetrical, uniform, sides often unequal; stem short; cavity broad, deep, acute, often russeted; calyx large, closed; lobes long, reflexed, often separated at base; basin abrupt, deep, wide. furrowed; skin tough, deep yellow with scattering pale yellow or russet dots; calyx-tube yellow, very broad at the top, conical, deep; stamens basal; core small, abaxile; cells symmetrical, closed or open; core-lines meeting; cells roundish, emarginate, concave; seeds numerous, tufted, plump, acute; flesh yellow, very firm, tender, crisp, coarse, juicy, subacid, rich, aromatic, sprightly; very good to best; November to January or February.

GROSH. *Grosh's Mammoth. Large Rambo, Ohio Beauty. Summer Rambo. Western Beauty.* The number of synonyms is usually a measure of merit—not so in the case of Grosh. While the apples are handsome when well-colored, they are not high in quality; and the trees, though good in most characters, have the fatal fault of not being able to carry the crop, much of which drops prematurely. The variety is at its best in Ohio, where it is reputed to have originated about 1840; it was described first in 1853.

Tree vigorous, upright-spreading, open, with long, stout, curved branches. Fruit large, uniform in size and shape, round-oblate to conical, regular or elliptical; stem short, thick; cavity acuminate, deep, wide, often compressed, smooth and green or russeted, symmetrical or gently furrowed, sometimes lipped; calyx large, usually open disclosing the yellow calyx-tube; lobes separated at the base, long, often leafy, acute; basin often oblique, large, medium in depth and width, abrupt, somewhat furrowed; skin thick, tough, waxy, greenish-yellow becoming bright yellow, washed and mottled with bright red and striped and splashed with carmine; except in highly colored specimens, yellow predominates; dots numerous, large, gray or russet, often areolar or white and submerged; calyx-tube large, wide at the top, conical; stamens basal to median; core small, axile or abaxile with hollow cylinder in the axis; cells symmetrical, closed or partly open; core-lines clasping; carpels ovate, emarginate, often tufted; seeds numerous, dark brown, often abortive, wide, obtuse; flesh slightly tinged with yellow, firm, coarse, tender, juicy, sprightly subacid, aromatic; good to very good; September to January.

HAAS. Fig. 25. *Fall Queen. Haas. Horse, Hoss. Yellow Horse.* Because of early bearing, thriftiness, hardiness, and productiveness in tree, Haas has been widely planted in different parts of America, and is still in favor in Texas and other parts of the South. It might be a universal favorite, were it not for the poor quality of the fruit, which has a flavor disagreeable to many. Haas originated over half a century ago on the farm of Gabriel Cerre, St. Louis, Missouri.



25. Haas. (×½)

Tree large, very vigorous, tall and upright becoming spreading, with long, slender branches. Fruit medium to large, oblate-conic, ribbed, sides usually unequal; stem short, thick, often partly red; cavity acute, deep, broad, usually symmetrical, covered with thin greenish-russet; calyx small, closed; lobes separated at base, short, narrow, acuminate; basin narrow, deep, abrupt, smooth or furrowed and wrinkled; skin thin, tough, smooth, yellow, mottled, washed and covered with bright red or brownish-red, striped and splashed with carmine; dots large, inconspicuous, numerous, pale or russet; prevailing effect red striped with carmine; calyx-tube variable, long and wide, conical; stamens median; core medium, abaxile; cells symmetrical, open or closed; core-lines clasping; carpels round to elliptical; seeds dark brown, large, plump, acute; flesh white, often stained with red, firm, fine, a little tough, juicy, sprightly subacid, aromatic, a little astringent; poor in quality; October to early winter.

HAWLEY. *Douse.* Few apples surpass Hawley in appearance and quality of fruit. The fruits are large, of the Fall Pippin type, made in a similar mould, and have a color of the same pleasing commingling of green and gold. But it is in quality that they become quite preëminent, being characterized by tenderness, crispness, juiciness and fineness of flesh, and richness of flavor. Hawley can be as readily characterized by its faults as by its merits: the apples cannot be kept long, are frequently water-cored or rotten at the core; the trees are unproductive; and fruit and foliage are susceptible to the scab-fungus.

Hawley originated from seeds planted by Mathew Hawley, New Canaan, New York, about 1750. It is to be found in all apple regions where there are fruit-growers of New York ancestry.

Tree large, vigorous, hardy, long-lived, susceptible to fungi, comes in bearing late, moderately productive. Fruit large or very large, uniform in size and shape, globular, oblate or conic, sometimes elliptical, ribbed; stem medium in length, slender; cavity acute, deep, wide and with outspreading russet rays; calyx large, partly closed; lobes often separated at the base, reflexed, wide, acute; basin deep, medium to wide, very abrupt, often furrowed; skin smooth, waxy, thin, pale green deepening to yellow, sometimes showing a faint brown blush, with scattering russet dots and flecks especially toward the cavity; calyx-tube large, wide, cone-shape, yellow or brown; core medium; cells closed; core-lines meeting; carpels flat, tufted, round, emarginate; seeds few, obtuse, medium in size, often abortive; flesh yellow, soft, tender, fine-grained, juicy, rich, mild subacid; very good; September to November or later.

HIBERNAL. *Romna.* Hibernal ranks among the best of the Russian apples—one of the most valuable in rigorous climates in the United States and Canada. The fruit is but mediocre for dessert or cooking, but the tree commends the variety most highly. The tree is not only one of the hardiest of its type, but also one of the most vigorous, healthy, and productive, making an excellent orchard plant either to produce its own fruit or upon which to graft less hardy or less vigorous varieties. The variety was imported from Russia between 1870 and 1880.

Tree vigorous, spreading, drooping; branches short, stout, curved, crooked and drooping. Fruit large, not uniform in shape or size, usually oblate-conic, often with sides unequal; stem short and stout, pubescent; cavity large, acute, deep, wide, furrowed, occasionally lipped, russeted; calyx large, open or partly closed; lobes often separated at the base, broad, acute; basin large, often oblique, narrow, abrupt, furrowed and wrinkled; skin thick, tough, smooth or roughened with flecks of russet; color pale yellow, with thin bloom, blushed and striped with bright carmine; dots small, numerous, pale yellow or gray, conspicuous; calyx-tube long, wide, funnel-shape; stamens median; core small, axile; cells closed; core-lines meeting; carpels round-ovate, emarginate, tufted; seeds small, short, plump, obtuse, dark brown; flesh yellow, firm, coarse, juicy, brisk subacid; astringent; fair to good; September to January.

HILAIRE. *St. Hilaire.* Hilaire is a seedling of Fameuse, from which it differs in bearing fruits a little larger, which keep longer and have a more acidulous flavor. Like Fameuse, Hilaire is of Canadian origin, having come from St. Hilaire, Quebec, about 1875, where it originated on the farm of Alexis Dery. Its culture is largely confined to the French settlements in Canada.

Tree large, vigorous. Fruit medium to large, uniform in size, oblate or round-oblate, irregular; stem medium, slender; cavity acuminate, deep and broad, not russeted, symmetrical; calyx medium, usually closed; lobes broad, obtuse; basin shallow, wide, abrupt, wrinkled, symmetrical; skin thin, tender, smooth, pale yellow overspread with red, covered with faint bloom, stripes obscure; dots very numerous, small, red, sometimes gray or russet; prevailing effect brilliant red deepening to dark red; calyx-tube long, narrow, funnel-shape; stamens median; core axile, small; cells closed or partly open; core-lines clasping the funnel cylinder; carpels round, emarginate; seeds dark, numerous, large, wide, obtuse to acute; flesh white tinged with red, fine, crisp, tender, juicy, sprightly subacid; good to very good; November to January.

HOADLEY. Hoadley is an apple of the Oldenburg group, differing from Oldenburg chiefly in ripening its crop a month later. The apples are not as high in quality as those of Oldenburg. The variety originated in Wisconsin about 1890, and its culture is chiefly confined to its native state.

Tree vigorous, upright-spreading. Fruit large, sometimes very large, round-oblate or conic, angular, sides unequal; stem short, thick; cavity acute, deep, broad, symmetrical, thinly and irregularly russeted; calyx large, closed or partly open; lobes long, broad, acute to obtuse; basin deep, narrow, wide, abrupt, furrowed; skin thick, tough, yellow overspread with bright red, mottled and irregularly striped and splashed with carmine; dots inconspicuous, submerged, pale; calyx-tube variable, short, wide, funnel-shape; core of medium size, abaxile; cells open; core-lines meeting; carpels broadly cordate or elliptical, tufted; seeds wide, long, plump, obtuse, dark colored; flesh yellow, firm, coarse, crisp, tender, very juicy, brisk subacid; good; late September to November.

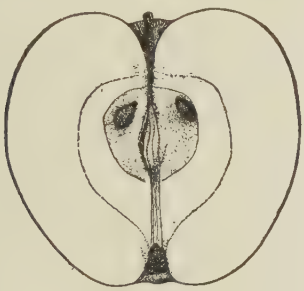
HOLLAND PIPPIN. *French Pippin. Summer Pippin.* Holland Pippin is often confused with Holland Winter and Fall Pippin. The following differences distinguish it from these two: Holland Pippin is a fall apple, while Holland Winter is in season in winter. Holland Pippin is a culinary fruit, while Fall Pippin is a choice dessert apple. Of the two, Holland Pippin is the earlier, going out of season soon after Fall Pippin begins to ripen. Holland Pippin is the greener fruit of the two, Fall Pippin being fit to use only when it is a golden yellow in color. The stalk of Holland Pippin is short and set in a wide cavity, while that of Fall Pippin is long and set in a narrow cavity. The trees of both varieties are much the same in habit and both are exceptionally satisfactory. The origin of Holland Pippin is unknown, but it has been grown in America over a century, its culture extending from the Atlantic westward to Michigan and Indiana.

Tree large, vigorous, spreading or round-topped. Fruit large or very large, uniform in size and shape, round or oblate-conic, obscurely ribbed; stem short, usually slender; cavity acute, medium in width, shallow, usually covered with thick outspreading russet; calyx pubescent, small, closed or partly open; lobes long, acute; basin shallow to deep, narrow, abrupt to obtuse, ridged and wrinkled; skin thin, tough, smooth, pale yellow with brownish-red blush which is conspicuously marked with large irregular, areolar dots; dots numerous, large and small, often submerged; calyx-tube wide, broadly conical; stamens median; core large, abaxile; cells unsymmetrical, open; core-lines meeting or clasping; carpels broad, narrowing toward base and apex, emarginate, tufted; seeds narrow, acute; flesh white, coarse-grained, crisp, tender, very juicy, brisk subacid; good to very good; September to October.

HOLLAND WINTER. Several apples pass under the name Holland Winter. The one which is supposed to have received the name first, and which is here described, is very similar to Rhode Island Greening. The fruits of Holland Winter are not equal to those of Rhode Island Greening in quality for either dessert or culinary use, but keep better and do not scald so badly in storage. The trees are vigorous, healthy, fruitful and usually bear annually. The variety is supposed to have come from the Holland district of Lincolnshire, England, and is at least two hundred

years old. When it came to America is not known, but it has been long grown in eastern America.

Tree vigorous, spreading, open; branches long, stout. Fruit medium to large, round-conic, symmetrical, regular or sometimes ribbed; stem short and thick; cavity acute, large, furrowed, occasionally with thin, outspreading russet rays; calyx small, closed or open; basin shallow, occasionally deep and abrupt, furrowed, wrinkled; skin tough, waxy, smooth, pale green often with a faint, dull blush; dots numerous, large, conspicuous, submerged, white, mingled with a few fine russet points; calyx-tube long, narrow, funnel-shape; stamens median; core of medium size, abaxile; cells symmetrical, open or partly closed; core-lines clasping; carpels round to elliptical, broad, tufted; seeds short, plump, obtuse; flesh white, firm, crisp, fine-grained, juicy, subacid, with mild pleasing aroma; good; December to May.



26. Hubbardston. (×½)

HUBBARDSTON. Fig. 26. *American Blush. Hubbardston Nonsuch. Nonsuch.* Hubbardston, under favorable conditions, is a most excellent apple. The fruits are of large size, handsome color, good enough for dessert, smooth, uniform, and are produced abundantly on a vigorous tree. Unfortunately, several faults condemn the variety for general culture. The apples, very good for dessert, are not at all suitable for culinary uses. The variety is so variable on different soils and in different climates in both tree- and fruit-characters as to be unsatisfactory. Thus, very often, the trees do not hold the crop well, the apples are undersized, poorly colored, drop badly; the crop does not keep its allotted time, and the trees suffer from winter injury. The variety takes its name from Hubbardston, Massachusetts, where it originated at least a century ago, and whence it has been widely disseminated throughout northern United States.

Tree vigorous, large, erect, spreading, dense. Leaves small, narrow, incurved. Fruit medium to large, round-ovate to round-conic, characteristically rounded toward the cavity, symmetrical, often obscurely ribbed; stem short; cavity deep, acute, symmetrical, sometimes furrowed, russeted; calyx small, open or closed; basin narrow, shallow to deep, furrowed, often marked with concentric flecks of russet in and about the basin; skin smooth or more often roughened with dots, flecks and fine veins of russet, covered with faint bloom; color yellow, blushed and mottled with red which varies from dull brown to bright red, more or less marked with carmine; dots pale or russet, often large and irregular, conspicuous on the red portions of the fruit; calyx-tube medium in length, broad, cone-shape; stamens median; core small, abaxile; cells symmetrical, closed or partly open; core-lines meeting or clasping; carpels broad, round, emarginate, tufted; seeds numerous, small, short, plump, acute, light brown; flesh yellow, firm, breaking, fine-grained, tender, crisp, juicy, aromatic, rich, at first sprightly but becoming mild subacid; very good to best; October to January.

HUNT RUSSET. *Golden Russet. New England Russet. Russet Pearmain.* Hunt Russet, a favorite of a century and a half ago but now no longer planted, is found in many old orchards in New England and New York. The fruits are attractive, of excellent quality, and keep remarkably well. The variety takes its name from a Mr. Hunt upon whose farm, near Concord, Massachusetts, it originated.

Tree vigorous, upright-spreading. Fruit medium or small, uniform, oblate to conical, often elliptical, uniform in shape; stem short, slender; cavity large, acute, deep, broad, sometimes furrowed and compressed; calyx partly open or closed; lobes medium in length, broad; basin deep to shallow, narrow to wide, abrupt, furrowed; skin thin, tender, golden-russet or with red-russet cheek; dots numerous, gray or russet; calyx-tube long, funnel-shape; stamens basal; core small, axile; cells symmetrical, closed; core-lines clasping the funnel cylinder; carpels round to elliptical, emarginate; seeds dark, medium in size, plump, usually obtuse; flesh yellow, fine, tender, juicy, subacid, sprightly becoming mild; very good to best; January to April or later.

HUNTSMAN. *Huntsman's Favorite.* Huntsman produces an excellent apple in appearance and quality, which sells as a fancy fruit in Missouri, Kansas, and nearby regions. The handsome color and delectable quality of the fruit, however, are offset by several serious faults, as: susceptibility to the scab and bitter-rot fungi; sun-burning of the fruit; and lateness in coming into bearing. These faults have kept the variety from becoming an apple of commercial importance. Huntsman originated on the farm of John Huntsman, Fayette, Missouri, sometime previous to 1872, when it was first described by Downing.

Tree vigorous, upright, open; branches long, straight, slender; internodes very short. Fruit large, round-oblate, conical, somewhat irregular, obscurely angular; stem short, thick; cavity acute, deep, broad, sometimes russeted, frequently furrowed, sometimes compressed; calyx small, closed; lobes short, narrow, acute; basin very abrupt, deep, narrow, usually deeply furrowed; skin thick, tender, yellow, often with an orange-red blush which sometimes deepens to distinct red; dots small, inconspicuous, pale, submerged, numerous; calyx-tube usually extends to the core, cylindrical; stamens marginal; core small, abaxile; cells often unsymmetrical, open; core-lines clasping; carpels elliptical, deeply emarginate, sometimes tufted; seeds irregular in shape, dark brown, wide and long, plump, obtuse; flesh yellow, firm, coarse, tender, juicy, mild subacid with a distinct pleasantly aromatic flavor; good to very good; December to April.

HURLBUT. *Hurlbut Stripe.* Hurlbut is one of the many mediocre apples having just sufficient merit to keep them in the limbo of the nurserymen's catalogs. It will be seen from the description that fruit and tree of Hurlbut are good but in no case superior. The variety originated at Winchester, Connecticut, nearly a century ago on the farm of General Leonard Hurlbut. Its cultivation has not spread far from the place of its nativity. It was first described by Cole in 1849.

Tree large, vigorous, spreading. Fruit medium to large, uniform in size and shape, round-oblate to oblate-conic, angular, symmetrical; stem short, slender; cavity acute, shallow, medium in width, symmetrical or compressed, usually closed; lobes long, narrow, acute;

basin shallow, narrow, abrupt, smooth or wrinkled; skin thick, tough, smooth, greenish-yellow overspread with brownish-red or dull red, splashed and striped with carmine; dots scattering, inconspicuous, usually submerged, sometimes russet; calyx-tube very short, wide, truncate conical with fleshy pistil point projecting into the base; stamens marginal; core of medium size, abaxile; cells wide open to closed; core-lines meeting; carpels round; seeds numerous, large, wide, long, plump, acute; flesh white or yellowish, firm, fine, tender, crisp, very juicy, aromatic, mild subacid; good to very good; October to January.

INGRAM. *Ingram Seedling.* Ingram is remarkable for two qualities—late-blooming, and late-keeping fruits. It is a seedling of Ralls, which it much resembles except for larger and more brightly colored apples. The fruit is but mediocre, and the variety has small value except when a tree is wanted which blooms late or an apple which keeps long. This variety has attracted much attention in the Southwest, especially in the Ozarks, but promises little in other regions. Ingram originated in the orchard of Martin Ingram, Springfield, Missouri, about 1850.

Tree vigorous, upright, dense, with long, stout branches. Fruit medium, sometimes large, round-conic to round-oblate, symmetrical; stem short, varying from thick and swollen to slender; cavity acuminate, from medium in depth and width to deep and broad, sometimes partly russeted, obscurely furrowed; calyx large, open; basin regular, deep, narrow, abrupt; skin thick and tough, smooth, pale yellow, washed, mottled and striped with two shades of red and clouded with white scarf-skin over the base; dots numerous, white areolar with russet center, conspicuous; calyx-tube conical; stamens basal; core small, axile; cells symmetrical, closed; core-lines meeting; carpels round, tufted; seeds wide, acute, tufted; flesh yellow, firm, and hard but becoming crisp and tender, juicy, very mild subacid, aromatic; good to very good; February to June.

IOWA BLUSH. This variety is briefly described by nurserymen of Iowa and Nebraska, who speak of it in superlative terms. It seems not to be known elsewhere. The author has been unable to learn its history, other than that it has been grown in the states named for at least twelve years. The tree is described as very vigorous and productive, but only second-hardy, not thriving in the Dakotas and northern Minnesota. The fruit is medium in size, round-conical, pale yellow with a red cheek. The flesh is yellowish, subacid or tart, rich and good. The season is November to February.

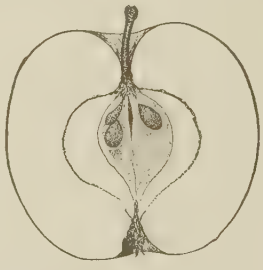
JACOBS SWEET. *Jacobs Winter Sweet.* Jacobs Sweet has many of the qualities which have made its more widely-known rival, Sweet Bough, a universal favorite. The apples of the two, in color, form, and texture are much alike. The fruits of this variety are very tender, crack easily, and are susceptible to the scab-fungus. Add to these faults, unreliability in keeping and great variability in season, and it may be seen why Sweet Bough is generally thought to be the better apple. The variety is best known in New England, where it originated at Medford, Massachusetts, about 1860.

Tree medium to large, vigorous, spreading. Fruit medium to large, round, inclined to conic, sometimes oblate, symmetrical; stem short; cavity wide, deep, acute, sometimes furrowed or compressed, seldom russeted; calyx closed or partly open; basin often abrupt, round, medium in width and depth; skin tough, waxen, glossy, yellow with a bright blush; dots obscure white or russet; calyx-tube cone-shape; stamens median; core large, abaxile; cells symmetrical, open or partly closed; core-lines clasping; carpels large, round to broad-obovate; seeds numerous, acute; flesh yellow, firm, coarse, very tender, crisp, juicy, aromatic, very sweet; good; October to April.

JEFFERIS. Jefferis is one of the best fall apples—fruits tender, pleasantly acidulous, rich, delicious. The trees, too, are satisfactory in all respects. But the apples ripen unevenly, are not attractive in color, and lack both size and uniformity, qualities which condemn the variety for any but the home orchard, where it is most deserving of a place. Jefferis originated with Isaac Jefferis, Chester County, Pennsylvania, and is first recorded in 1848. It is grown in all of the eastern states.

Tree of medium size, vigorous, upright, open. Fruit small, uniform in size and shape, round-oblate, conic, regular or obscurely ribbed; stem of medium length, thick; cavity acute, medium in depth, broad, symmetrical; calyx small, closed or open; lobes short, broad, acute; basin shallow to deep, wide, abrupt, smooth, symmetrical; skin thin, tough, pale yellow, blushed and mottled with dull red overlaid with narrow splashes and stripes of carmine; dots small, scattering, inconspicuous, submerged or russet; calyx-tube narrow, conical; stamens marginal; core small, axile; cells open; core-lines clasping; carpels elliptical, emarginate, sometimes tufted; seeds numerous, large, wide, long, flat, very irregular, obtuse; flesh yellowish-white, firm, fine, crisp, tender, very juicy, mild, subacid; very good; September to January.

JERSEY SWEET. Fig. 27. *American.* In spite of faults, there is much in the fruit of Jersey Sweet to commend it for home use and local markets. Its faults are: susceptibility to the scab-fungus, early decay, and failure to



27. Jersey Sweet. (×½)

color well in most environments. To offset the faults, the quality is of the best, making a good sweet apple for either dessert or cooking. The tree-characters are excellent. The origin of the variety is unknown, but it has been listed in pomologies since 1845.

Tree large, vigorous, upright or round-topped, open; branches long, stout, filled with spurs. Fruit medium size, round-ovate, conic or oblate-conic, sides unequal; stem long, slender; cavity acute, deep, medium in width, occasionally lipped, russeted; calyx small, closed; lobes long, narrow, acute; basin small, shallow, narrow, abrupt, ribbed and wrinkled; skin fine, tender, yellow washed and mottled with brownish-red and overlaid with narrow stripes of carmine; dots inconspicuous, greenish, submerged; calyx-tube narrow, conical, often with fleshy pistil point projecting into the base; stamens median; core large, axile; cells symmetrical, usually closed; core-lines clasping the funnel cylinder; carpels elongated-ovate, tufted; seeds large, acute; flesh yellow, firm, fine, crisp, tender, juicy, sweet; good to very good; September to December.

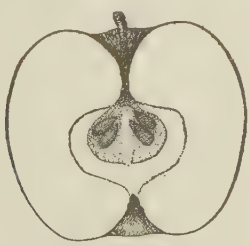
JEWETT RED. Fig. 28. *Nodhead.* Jewett Red is an early winter apple of the Blue Pearmain type, more or less grown and highly esteemed in parts of New England. The apples are handsomely colored—dark red

28. Jewett Red. (×½)

covered by a heavy, blue bloom; and the quality is excellent, the flavor being a pleasing mingling of sweet and sour. The trees are precocious in bearing, but grow slowly, and are seldom productive. The variety originated at Hollis, New Hampshire, early in the nineteenth century.

Tree small, spreading, open; branches short and stout with few laterals and numerous spurs. Fruit of medium size, uniform in size and shape, round-oblate, sides unequal, obscurely ribbed, often irregular; stem short; cavity variable, acute, shallow, wide, furrowed obscurely, green or russeted, sometimes lipped; calyx small, open or partly closed; lobes broad, short, obtuse; basin shallow, wide, obtuse, obscurely furrowed and wrinkled; skin thin, tough, smooth, dark red over yellow background, often deepening to purplish-red and obscurely marked with broken stripes and splashes of carmine; dots numerous, conspicuous, pale yellow with characteristic scarf-skin overspreading the base; prevailing effect deep red; calyx-tube narrow, funnel-form; stamens median; core axile; cells closed or open; core-lines clasping; carpels oval, elongated, emarginate; seeds numerous, clear reddish-brown, small; flesh yellow, fine, tender, juicy, pleasantly aromatic, mild subacid; good to very good; October to February.

JONATHAN. Fig. 29. Jonathan has a world-wide reputation, and the apples by general consent are placed among the very best in both appearance and quality. Though only medium in size, the fruits are large enough for



29. Jonathan. (×½)

a dessert apple. The brilliant red skin, indistinctly striped with carmine and underlaid with pale yellow, contrasting with the nearly white flesh; and the shapely, round-conic, smoothly and regularly turned form, make it one of the most attractive apples. The flesh is firm, crisp, tender, juicy, not especially rich in flavor, but peculiarly sprightly and refreshing, having a distinct and most pleasing aroma. The season is from November to January, longer in cold storage, with the greatest demand at Christmas. Unfortunately, when the apples are kept long in either common or cold storage, dark spots develop in the skin which greatly mar their appearance. The trees are usually hardy, vigorous and productive, and very accommodating as to soils and climates, requiring, however, a fertile soil, and developing fullest perfection in cool climates. The variety is an inviting prey to insects and fungi, and the trees must be carefully sprayed. Jonathan is grown best in parts of the Middle West and the Pacific Coast states. The variety originated on the farm of Philip Rick, Ulster County, New York, about 1800, and the name commemorates Jonathan Hasbrouck, who had the honor of first calling attention to this excellent apple.

Tree medium in size, vigorous, round or spreading, drooping, dense. Leaves small, narrow. Fruit small, rarely large, round-conic to round-ovate, often truncate, regular, uniform in shape and size; stem medium to long, slender; cavity acute, deep to very deep, abrupt, narrow; skin thin, tough, smooth, pale yellow striped with carmine, covered with red which deepens on the sunny side, often showing contrasting bits of pale yellow about the cavity; dots minute, inconspicuous; calyx-tube small, funnel-shape; stamens basal; core small, axile; cells symmetrical but often not uniformly developed, usually closed; core-lines clasping the funnel cylinder; carpels concave, round to round-cordate, emarginate, smooth; seeds large, long, acute, dark, numerous; flesh yellow, sometimes with a tinge of red, firm, fine, crisp, tender, juicy, very aromatic, sprightly subacid; very good to best; November to January.

JULY. *August. Fourth of July.* July, in fruit, is almost a facsimile of the well-known Tetofsky, which surpasses it in tree-characters, in which the two are quite distinct. It is an old Russian variety introduced into America sometime previous to the Civil War as an apple suitable for cold regions.

Tree vigorous, upright, roundish, dense. Fruit medium, uniform in shape but not in size, round-conical, irregularly ribbed, sides often unequal; stem long, slender, often bracted; cavity acuminate, deep, medium, furrowed, thinly russeted; calyx large, usually closed; lobes narrow, acuminate; basin shallow to medium, narrow, abrupt, furrowed and wrinkled; skin thin, tough, smooth, glossy, pale yellow washed and mottled with red, striped and splashed with carmine and overspread with bloom; dots small, numerous, submerged, inconspicuous, light, areolar; calyx-tube variable in length, funnel-shape; stamens median; core medium, axile; cells closed; core-lines clasping; carpels round-ovate or elongated-ovate; seeds dark dull brown, wide, short, plump, obtuse; flesh yellow, coarse, crisp, tender, juicy, sprightly subacid; fair to good; July to September.

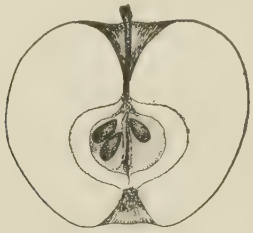
KESWICK. *Keswick Codlin.* This is an English apple of small value in America. The variety may be recommended more for its tree- than its fruit-characters. It was brought to America and widely disseminated early in the nineteenth century.

Tree large, vigorous, upright-spreading. Fruit large, round-conic or oblong-conic, broad at the base, ribbed, sides frequently unequal; stem short, slender to thick; cavity variably acute, shallow, narrow, russeted; calyx closed; lobes long, medium in width, acuminate; basin shallow, narrow, furrowed or angular, often with fleshy protuberances alternating with the calyx-lobes; skin thin, tough, smooth, waxy, yellow, sometimes with a faint blush and often with a suture line extending out from the cavity; dots submerged, inconspicuous or rus-

set; calyx-tube wide, bluntly cone-shape; stamens median; core variable, large, abaxile; cells wide open; core-lines meeting; carpels variable, round-ovate; seeds light brown, small, short, plump, acute; flesh white, fine, tender, juicy, brisk subacid; fair to good; August and September.

KING: See Tompkins King.

KING DAVID. Fig. 30. This apple is a cross between Jonathan and Arkansas Black, resembling both parents in one or more characters. The trees are equal to either in hardiness, productiveness, vigor, and health. The apples are about the size of those of Jonathan and even better colored, as beautiful as any in the orchard; for added to the deep, solid, red color are rotundity in shape and uniformity in size; these three qualities give the fruits an almost perfect appearance. The apples hang long on the tree, all the while deepening in color, but for late keeping should be picked as soon as overspread with red and before the seeds are well ripened. The flesh is firm, fine, crisp, tender, spicy, and juicy. The chief fault of the fruit is a tendency to



30. King David. (×½)

decay at the core, especially when over-ripe. King David was found growing in a fence-row in Washington County, Arkansas, in 1893, and was introduced by Stark Brothers, Louisiana, Missouri, in 1902.

Tree vigorous, healthy, hardy, productive; branches long, moderately stout. Fruit of medium size, round-oblate to oblate-conic, slightly ribbed; stem medium in length, slender; cavity moderately deep and broad, usually russeted; calyx small, closed; basin medium in depth, somewhat abrupt, furrowed; skin thin, tender, smooth; color pale greenish-yellow, almost entirely overspread with a very attractive deep, dark red, changing to scarlet; core rather large, open, abaxile, with clasping core-lines; calyx-tube long, narrow, funnel-shaped; flesh distinctly yellow, firm, crisp, moderately tender, juicy, brisk subacid, spicy and aromatic; quality good to very good; November to February.

KINNAIRD. *Kinnaird's Choice. Kinnaird's Favorite.* Kinnaird is an attractive, dark-red apple similar to Winesap in size, quality, color, and season. The variety originated at Franklin, Williamson County, Tennessee, and is now grown only in its native and neighboring states.

Tree medium in size, vigorous, spreading, irregular; branchlets slender. Fruit medium to large, oblate to conic, flat at the base, obscurely ribbed, sides sometimes unequal; stem not exserted, short, thick; cavity very wide, deep, acute, sometimes russeted; calyx small, closed or partly open; basin wide, deep, abrupt, gently furrowed, often oblique; skin thick, tough, smooth, yellow, mottled and blushed with red, in the sun deep red; dots numerous, small, white, elongated towards the cavity; prevailing effect dark red; calyx-tube conical, short to cylindrical and deep, sometimes extending to the core; stamens marginal; core small, axile; cells symmetrical, closed; core-lines clasping; carpels obcordate, emarginate, concave, tufted; seeds short, wide, plump; flesh yellow, crisp, fine or a little coarse, agreeably subacid, aromatic; good to very good; season, November to March.

LADY. Fig. 31. *Api. Christmas Apple.* This variety is known wherever apples are grown, usually, except in America, under the name Api with some modifying term. Its popularity is due to its beautiful miniature fruits which are of highest quality, most suitable for dessert and for decorative purposes. The apples keep well until April or May, but are in greatest demand during the holiday season. The trees are not very satisfactory, being small, very dense in growth, unproductive, and come in bearing late. The fruit is borne in clusters on short spurs and hangs well to the tree. The variety is very susceptible to the apple-scab fungus. Lady has been in cultivation in France, under the name Api, for over three hundred years, and was one of the first European apples to be brought to America.

31. Lady. (×½)

Tree vigorous, dwarf, dense, erect; branches erect, slender. Leaves narrow. Fruit very small, uniform in size and shape, oblate to round-conic, obscurely ribbed, symmetrical; stem slender; cavity large and wide, obtuse, shallow, gently furrowed, sometimes thinly russeted; calyx small, closed; lobes small, acute; basin wide, shallow, obtuse, narrowly ridged and wrinkled; skin thick, tough, smooth, glossy with a deep red blush which is often irregularly and sharply outlined against the pale yellow ground-color; dots white or with russet points, inconspicuous; calyx-tube conical with short, truncate cylinder; stamens marginal; core small, axile; cells symmetrical, closed; core-lines clasping; carpels smooth, round or elliptical, emarginate, mucronate; seeds plump, wide, obtuse, completely filling the cells; flesh white, firm, fine-grained, crisp, tender, juicy, aromatic, mild subacid; good to very good; December to May.

LADY SWEET. *Pommeroy.* Lady Sweet has few rivals among sweet apples in its season. The fruits are superior in size, color, flavor, and keeping qualities. The trees come in bearing young and bear regularly and heavily, though they are not remarkably vigorous, are short-lived, and often suffer from winter injury. Fruit and foliage are quite susceptible to apple-scab. The season is from late autumn to late spring. Lady Sweet originated near Newburg, New York, and was brought to notice by Downing in 1845. It is a general favorite in the North Atlantic states and the Middle West.

Tree upright-spreading, vigorous. Leaves narrow, small, ovate. Fruit large, uniform in size and shape, round-conic, often approaching oblong-conic, irregularly elliptical, often ribbed, symmetrical; stem short; cavity acute, deep, narrow, sometimes wide, gently furrowed, often russeted, sometimes lipped; calyx small, closed, pubescent; basin small, narrow, shallow, abrupt, furrowed; skin thin, smooth, yellow overspread with bright red splashed with carmine, mottled and striped with white scarf-skin about the cavity; dots conspicuous, pale

areolar with russet point or submerged, numerous toward the basin; calyx-tube conical; stamens basal; core small, axile to abaxile; cells not uniformly developed, closed; core-lines meeting or clasping; carpels broad, round to round-ovate, mucronate, sometimes emarginate, tufted; flesh yellow, firm, fine, crisp, tender, juicy, sweet, with a distinct and pleasant aroma; very good to best; November to April or May.

LATE STRAWBERRY. Fig. 32. *Autumn Strawberry. Fall Strawberry.* The true Late Strawberry is one of the best dessert apples of its season. It is, however, an apple only for the home orchard. Its reputation has suffered because of confusion in nomenclature, several distinct sorts being grown as Late Strawberry. The variety is debarred from commercial plantation because of the small

32. Late Strawberry. (×½)

size of the fruit and the long period of maturity, which makes several pickings necessary. The beauty and high quality of this apple should make it a favorite in orchards planted for choicely good fruit. The variety originated at Aurora, Cayuga County, New York, and was first described in 1848.

Tree medium to large, vigorous, upright-spreading, hardy, healthy, long-lived, yielding regularly and heavily. Fruit small, uniform in size and shape, round or oblong-conic, sometimes strongly ribbed, irregular; stem long, slender, often curved; cavity acuminate, deep, broad, furrowed, sometimes with thin radiating streaks of light russet mingled with carmine; calyx large, open; lobes often separated at base, short, acute, erect or reflexed; basin deep, wide, abrupt, furrowed and wrinkled; skin pale yellow often almost entirely overspread with bright red, dotted and streaked with purplish-carmine; dots inconspicuous, light colored; prevailing effect bright striped red; calyx-tube wide, conical; stamens basal; core small, axile to abaxile; cells closed or open; core-lines meeting; carpels obovate; seeds large, flat, obtuse; flesh yellow, fine, crisp, tender, juicy, sprightly, aromatic, subacid; very good; September to December.

LAWVER. *Black Spy. Delaware Winter.* Lawver retains a place in pomology because of the attractive appearance and long-keeping quality of the fruit. The apples are a handsome red, very uniform in shape and size, and keep in common storage until May or June. They are, however, but mediocre in quality—scarcely desirable for either dessert or culinary purposes. The trees come in bearing early, and, as a rule, yield large crops biennially. The variety is at its best in southern latitudes; in the North the apples run small in size and poor in color and quality. Fruit and foliage are subject to apple-scab. The origin of Lawver is uncertain, but it is said to have come from Parkville, Missouri, soon after the Civil War, and to have been reintroduced from Delaware under the name Delaware Winter.

Tree vigorous, round-spreading, dense; branches long, stout, curved. Fruit medium to large, round or oblate, regular and symmetrical; stem variable, often long and slender; cavity acute or acuminate, deep, large and broad, often compressed or furrowed, more or less russeted and often with outspreading russet rays; calyx small, closed or open, often leafy; lobes sometimes separated at the base; basin wide, flat and obtuse, sometimes deep and abrupt, gently furrowed, sometimes wrinkled; skin thin, tough, smooth, occasionally showing the yellow ground-color but usually covered with bright red which deepens about the base and is often mottled and streaked with dull gray scarf-skin, toward the apex lighter red; dots white or russet, small and numerous about the basin, large and scattering toward the cavity; calyx-tube long, narrow at top, funnel-form; stamens median; core abaxile, medium in size; cells symmetrical, open or closed; core-lines clasping; carpels concave, round to obcordate, tufted; seeds dark, large, wide, obtuse, tufted; flesh yellow, firm, breaking, fine, crisp, tender, juicy, brisk subacid, aromatic; fair to good; January to May or June.

LEHIGH GREENING. Lehigh Greening is of the Pippin rather than of the Greening type, though the two groups are very similar. Were there not several other better sorts of its kind, the variety would be rated as an excellent green winter-apple. Its origin is not known, but it has been grown in Lehigh County, Pennsylvania, since 1840 at least.

Tree vigorous, wide-spreading, open; branches stout, crooked. Fruit medium to large, uniform in size and shape, round-oblate to round-conic, sides sometimes unequal; stem medium to long, slender; cavity acute, medium in depth, narrow, sometimes lipped, russeted and often with outspreading russet rays; calyx open; lobes narrow, acuminate, often separated at the base; basin large, abrupt, shallow, wide, gently furrowed; skin dark green becoming waxen yellow, occasionally with a thin blush of bright red; dots numerous, submerged or pale areolar with russet point; calyx-tube long and wide, broadly funnel-shape; stamens median; core small, abaxile; cells symmetrical, wide open; core-lines clasping; carpels pointed-ovate to broadly cordate, tufted; seeds numerous, medium in size, dark brown, elongated, plump, acute; flesh yellow, firm, fine, crisp, tender, juicy, sprightly, mild subacid, aromatic; good or very good; January to May.

LIMBERTWIG. *James River.* Limbertwig is a rather common appellation for varieties of apples having willowy twigs. Possibly a dozen varieties have been so called in different parts of America, but the name belongs properly to a variety producing a medium-sized, deep-red, late-keeping apple rather popular in southern latitudes. The tree is vigorous and productive, its slender branches usually bending in season with a heavy crop. The fruit keeps from April until May. The origin of Limbertwig is not known; the earliest notice is that of Kenrick in 1832.

Tree thrifty, productive, fruit hanging well to the tree; laterals slender becoming drooping with heavy crops. Fruit medium, uniform in size and shape, round to oblate-conic, symmetrical and regular; stem medium in length and thickness, usually not exserted; cavity acuminate, deep, broad, sometimes russeted, smooth or gently furrowed; calyx small, closed or partly open; lobes short, broad, sometimes recurved; basin small, narrow, shallow and obtuse or deep and abrupt, often furrowed; skin roughened with numerous conspicuous russet dots, yellow covered with red, deepening in the sun to dark red, obscurely striped with dull carmine, sometimes marked with broken russet veins; prevailing effect dark red; calyx-tube cone-shape; stamens median; core sessile, abaxile, small; cells not uniformly developed, symmetrical, closed or open; core-lines clasping;

carpels concave, elliptical, deeply emarginate, much tufted; seeds numerous, elongated, small, plump, obtuse, much tufted, clinging to the carpels; flesh yellow, firm, fine, juicy, aromatic, subacid; good; January to April.

LONGFIELD. *English Pippin. Good Peasant.* Longfield is the best dessert fruit of a hundred or more sorts imported from Russia, though it falls below the average of the apples of its nativity in several other characters. The apples do not take high rank in the market as they can be kept but for a short time after harvesting, and their delicate color and tender flesh bruise with the least roughness of touch. Besides being excellent in quality, the apples are handsome in appearance and very good in cookery. The trees are extremely hardy, and, though small in size, exceedingly productive. It is a very good apple for home use in all regions where hardiness is an important factor. The variety was introduced from Russia by the United States Department of Agriculture in 1870, and is now widely grown in the United States and Canada.

Tree medium in size, round or spreading, dense, low, with short, stout, crooked branches and drooping laterals filled with small spurs. Fruit medium, uniform in size and shape, round-conic, ribbed; stem short, slender; cavity acuminate, deep, narrow, symmetrical, usually russeted; calyx small, leafy, closed or partly open; lobes long, narrow, acute; basin small, shallow, narrow, abrupt, furrowed and wrinkled; skin thin, tender, smooth, glossy, pale waxen-yellow with a lively blush but not striped; dots few, small, inconspicuous, white, submerged; prevailing effect bright yellow blushed with lively red; calyx-tube narrow and elongated, often extending to the core; stamens basal; core medium, axile; cells symmetrical, not uniformly developed, closed or partly open; core-lines clasping the funnel cylinder; carpels round, emarginate; seeds large, dark brown, long, acute; flesh white, fine, crisp, very tender, juicy, subacid, sprightly, aromatic; good to very good; September to October.

LOUISE. *Princess Louise. Woolverton.* Louise is a seedling of Fameuse, from which it differs in having fruits a little larger and much less red in color, the red overlaying a very yellow background with a lively blush, the whole apple being overspread with soft bloom. The tree is much the same as that of its parent. Though at best very handsome, with a distinctive flavor and aroma, in general the fruits fall short of those of Fameuse and the better-known McIntosh of the same group. Louise originated with L. Woolverton, Grimsby, Ontario, about 1875, and is little known outside of Canada.

Tree medium in size, vigorous, upright-spreading, dense, with long, slender branches and willowy laterals. Fruit medium in size, uniform in size and shape, round or round-oblate, often elliptical or obscurely angular, sides often unequal; stem red, long, slender; cavity obtuse, sometimes acuminate, shallow, broad, furrowed; calyx closed or slightly open; basin shallow, narrow, obtuse, lightly furrowed and wrinkled; skin thin, tough, pale yellow, with lively red blush, striped obscurely if at all, overspread with thin bloom; dots inconspicuous, pale, submerged; calyx-tube short, wide, conical; stamens median; core large, abaxile; cells symmetrical, partly open; core-lines meeting; carpels elongated-ovate; seeds long, acute; flesh white, fine, crisp, tender, juicy, mild subacid, aromatic, with some of the perfume of McIntosh; good to very good; October to February or later.

LOWELL. *Greasy Pippin. Tallow. Tallow Pippin.* Though now superseded by better sorts of its season, Lowell was a most important variety in the apple orchards of a generation ago. It is preëminently an apple for the home orchard, since it furnishes fruit for dessert or cooking from late summer to early winter. The flesh, while coarse, is pleasantly flavored, and the large, bright-yellow apples, with a most perceptible coating of wax, giving rise to the expressive names Greasy Pippin and Tallow Pippin, are very attractive in appearance. Where and when it originated is not known, but it has been under cultivation for at least a century and is generally distributed throughout the East and North.

Tree large, vigorous, upright-spreading, open. Fruit large, uniform in size but variable in shape, round-oblong, conic, unsymmetrical, irregular; stem long, thick, deflected to one side; cavity acute, shallow, broad, often russeted; calyx large, closed or partly open; basin shallow, medium in width, abrupt, often furrowed and wrinkled; skin thin, tender, smooth or with occasional russet dots and flecks, waxy, rich yellow; dots numerous, inconspicuous, brown, russet or submerged; calyx-tube long, wide, conical; stamens median; core large, axile to abaxile; cells closed; core-lines meeting or clasping; carpels obovate, emarginate; seeds dark brown, medium in size, obtuse; flesh yellow, firm, fine-grained, crisp, tender, very juicy, sprightly subacid; good to very good; August to October.

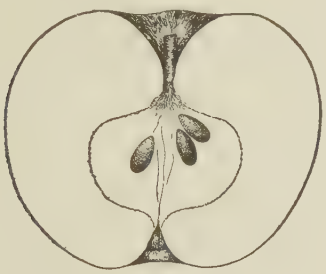
LOWLAND RASPBERRY. *Liveland.* Lowland Raspberry, more often known as Liveland, is an early Russian apple very popular in the apple regions of the Great Plains. The fruit is beautiful and of very good quality for an early apple, surpassing all other Russian apples in both appearance and quality, but the skin is so tender that the fruit is suitable only for home use and local market. The variety was introduced from Russia about 1880. It is described in the catalogs as follows:

Tree vigorous, not large, upright, very hardy, productive. Fruit medium to large; color waxen white, striped, shaded and marbled with light carmine; flesh white, often stained with red, fine, very tender, pleasant, mild subacid, almost sweet; August or with Yellow Transparent.

McAFEE. *McAfee Red. McAfee's Nonesuch. Striped Sweet Pippin. Winter Pippin.* This is an old sort, once very popular in the South and parts of the Middle West, now but little planted. The apples are well flavored and attractive but rather too mild and characterless in flavor. There are no remarkable tree-characters. McAfee originated near Harrodsburg, Kentucky. Elliott called attention to it in 1854.

Tree medium in size, vigorous, spreading. Fruit medium to large, round-oblate, regular; stem short to long; cavity large, wide, acute, deep, gently furrowed, often with thin outspreading russet; calyx small, closed; basin shallow, narrow, sometimes broad, wrinkled and gently furrowed; skin thin, smooth, yellow faintly washed with red and splashed and striped with carmine, often marked at the base with thin, gray, mottled scarf-skin and sometimes with fine, irregularly broken russet lines; dots minute, indented, gray or white with some large and areolar; prevailing effect striped-red; calyx-tube funnel-form; stamens median to basal; core abaxile, round; cells symmetrical, open; core-lines clasping the funnel cylinder; carpels concave, tufted, broadly obovate; seeds numerous, large, long, wide, obtuse, dark; flesh yellow, coarse, breaking, tender, juicy, mild subacid; good to very good; October to February.

McINTOSH. Fig. 33. *McIntosh Red.* If one were compelled to choose the apple of apples as the season's varieties pass by, choosing in respect to the qualities which, united, gratify the greatest number of senses, few would hesitate in naming McIntosh sovereign of all. The fruits of McIntosh are uniquely beautiful, outwardly and inwardly, the flavor is hardly surpassed, and the whole apple is most agreeably perfumed. The bright deep-red color is made more attractive by a heavy



33. McIntosh. (×½)

and characteristic bloom. Well grown, each apple seems to have been turned out of the same mould—a sphere modified by a little oblateness. When the apples are cut, flesh of snowy whiteness rimmed and stained with red is exposed—firm, fine, crisp, tender, and juicy, with a rich, delicious, and very distinctive flavor. The trees are vigorous, hardy, and healthy. Three serious faults detract from its value as a commercial fruit: apple-scab fungus seriously disfigures fruit and foliage; the crop ripens unevenly; and the apples seldom hang until sufficiently mature. The variety originated in Dundas County, Ontario, on the McIntosh homestead, from which its distribution was begun about 1870.

Tree vigorous, round or spreading, with numerous small, slender laterals. Fruit large, uniform in shape and size, round-oblate, regular; stem short, stout, slender, usually not exserted, often with irregular protuberances; cavity large, acuminate, wide, broadly furrowed, often partly russeted; calyx small, closed or partly open; lobes short, narrow, acute; basin pubescent, small, narrow, abrupt, smooth or obscurely furrowed; skin thin, tender, smooth, readily separating from the flesh, pale-yellow washed and deeply blushed with bright red and striped with carmine, highly-colored specimens dark red with the carmine stripes obscure, overspread with bloom; dots white or yellow, small; calyx-tube short, conical, with broad limb; stamens median; core abaxile; cells wide open; core-lines meeting, carpels elliptical, smooth, concave; seeds brown, large, acute; flesh white, sometimes veined with red, firm, fine, crisp, tender, very juicy, perfumed, sprightly subacid; very good to best; October to December or later.

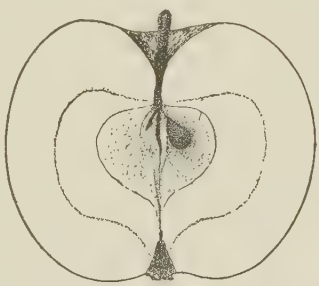
McMAHON. *McMahon White.* McMahon in quality is similar to Alexander, of which it is possibly a seedling, but does not equal it in any characters which contribute to making a commercial variety. The apple is not good enough in quality for home-growing. The variety originated about 1860 in Richland County, Wisconsin, and its culture is confined to its native and nearby states.

Tree medium in size, vigorous, spreading. Fruit large or very large, round-conic, faintly ribbed; stem medium in length, thick; cavity remarkably acuminate, very deep, broad, compressed, russeted and with outspreading rays; calyx small, open; lobes separated at base, short; basin deep, narrow, abrupt, compressed, furrowed and wrinkled; skin pale yellow or nearly white with irregular stripes and patches of white scarf-skin extending from the cavity over the base, often having the cheek overspread with a thin blush, faintly splashed and striped with carmine; dots few, inconspicuous, green or russet; calyx-tube long, wide, broadly conical or cylindrical; stamens median; core small, abaxile to axile; cells symmetrical, closed or open; core-lines meeting; carpels round or elliptical, emarginate; seeds dark brown, plump, obtuse; flesh white, fine, tender, juicy, sprightly subacid; fair to good; October to February.

MAGOG. *Magog Red Streak.* Magog has been on probation for nearly a half century—not good enough to recommend and too good to condemn. If worth growing at all, it is only in northern latitudes where hardiness is necessary. The variety originated at Newport, Vermont, about 1870, and its culture is confined to New England, Canada, and the Great Plains, being most popular in the last-named region.

Tree vigorous, upright-spreading. Fruit large, uniform in size but variable in shape, round-oblong, sometimes conic or ovate, regular or faintly ribbed, sides often unequal; stem short, thick; cavity acute, medium in depth, narrow, usually smooth, occasionally lipped, often irregularly russeted; calyx small, closed; lobes narrow, acute; basin medium in width and depth, sometimes abrupt, coarsely wrinkled; skin thin, tough, smooth, waxy, pale yellow, lightly washed and mottled with thin brownish-red, sparingly striped and splashed with deeper red; dots numerous, light, submerged, areolar, brown and russet; prevailing effect yellow; calyx-tube long, conical, with long cylinder; stamens marginal; core large, abaxile; cells open; core-lines clasping the funnel cylinder; carpels broad-obcordate, sometimes tufted; seeds light brown, small, wide, short, plump, obtuse; flesh yellow, firm, fine-grained, tender, very juicy, sprightly, pleasant subacid, aromatic; good; season, October to January or later.

MAIDEN BLUSH. Fig. 34. *Lady Blush. Red Cheek.* This old favorite, known by fruit-growers in America everywhere for over a century, attained and holds its popularity chiefly by virtue of its distinctive and very



34. Maiden Blush. (×½)

handsome crimson-cheeked, lemon-yellow apples. The fruits are unique in form as well as color, each an oblate sphere. The apples are not high enough in quality to relish out of hand, but are very good for cooking, evaporating, and for the markets. The crop does not mature uniformly, is very susceptible to the scab-fungus, and does not keep well in either

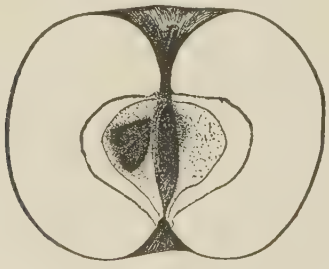
ordinary or cold storage. The trees are above the mark in most characters. The variety was named by Coxe as very popular in Philadelphia as long ago as 1817. It is probably as widely disseminated in America as any other apple.

Tree medium in size, vigorous, spreading, open. Fruit medium, sometimes large, uniform in size and shape, oblate, sometimes conic, regular, symmetrical; stem short, slender; cavity large, acute, medium to wide, shallow, usually symmetrical, sometimes russeted; calyx closed; lobes separated at base, broad, acute; basin shallow, medium to wide, obtuse, regular, smooth or furrowed, symmetrical; skin thin, tough, smooth, pale waxen yellow with crimson blush; dots numerous, white, submerged or areolar; calyx-tube small, narrow, conical; stamens median; core of medium size, axile or somewhat abaxile, broad-elliptical; cells closed or slightly open; core-lines meeting or clasping; carpels broad-ovate; seeds brown, wide, long, plump, acute; flesh white or with yellow tinge, fine, crisp, tender, very juicy, subacid; good; September to November or December.

MALINDA. This is one of the ironclad varieties recommended in the northern states of the Great Plains for its hardiness. When an especially hardy tree is wanted, Malinda is top-worked on Hibernal, the tree on its own roots being a rather poor grower. The fruit ranks very fair in quality. The variety originated in Orange County, Vermont, and was taken to Minnesota as early as 1860.

Tree very hardy, a slender, straggling grower in the nursery and lacking vigor on its own roots in the orchard. Fruit medium to large, sharply conical, angular and ribbed; stem short; cavity acute, regular, with stellate, russet dots; calyx closed; basin abrupt, narrow, deep, wrinkled; skin smooth, rich yellow with dull blush; dots numerous, minute, distinct, white; calyx-tube conical; stamens median; core closed with core-lines meeting; flesh yellowish-white, very juicy, mild subacid with a sweet after-taste; quality fair; late winter.

MANN. Fig. 35. By virtue of several good qualities, Mann gained a high reputation a quarter of a century ago. The trees are vigorous, hardy, healthy, and productive, and the fruit keeps and ships well. But the apples,



35. Mann. (×½)

of the Rhode Island Greening type, are but mediocre in quality. With the advent of better care of orchards and of better shipping and transportation facilities, the need for a general purpose apple of this type began to wane, and Mann was doomed to lose the commercial importance it had acquired. The variety originated in the orchard of Judge Mooney, Granby, New York, about 1870, and later was introduced into Niagara County by a Dr. Mann, who gave it his name. It is most commonly grown in New York.

Tree medium to large, vigorous, at first upright and dense but after bearing spreading. Fruit medium to large, round-oblate, symmetrical, usually regular, sometimes faintly ribbed, uniform in size and shape; stem short, usually not exserted; cavity acuminate, narrow, deep, usually russeted and often with outspreading broken russet, furrowed; calyx small, closed or partly open; lobes acute; basin abrupt, narrow, usually symmetrical, furrowed and wrinkled; skin thick, tough, green, often with a brownish-red blush tinged with olive-green but late in the season yellow; dots numerous, large, conspicuous, areolar, white with russet center; calyx-tube wide, cone-shape; stamens median; core small, usually axile; cells symmetrical, usually closed, sometimes open; core-lines meeting; carpels smooth, broad, narrowing towards the base and apex; seeds numerous, wide, obtuse, dark; flesh yellow, coarse, juicy, at first hard but becoming tender and crisp, subacid; fair to good; March to April.

MELON. *Norton's Melon. Watermelon.* The apples are rotund, red-cheeked, smooth-skinned, of medium size, very uniform, and, all in all, most attractive when well grown. The flesh is tender, crisp, fine-grained, very juicy, and has a sprightly but rich and aromatic flavor. Unfortunately, the variety thrives only on choice apple soils, and the product is too often undersized, poorly colored, and unattractive. The tree, in locations suited to it, is vigorous, hardy, and productive, though susceptible to apple-scab. Melon originated in East Bloomfield, New York, in a seedling orchard planted by Heman Chapin about 1800. The variety is most popular in New York and New England.

Tree medium in size, vigorous, upright-spreading. Leaves large, broad. Fruit variable in size, medium to large, round-conic, sometimes oblate-conic, often more or less elliptical and obscurely ribbed, symmetrical; stem short, slender; cavity acute, deep, narrow to wide, often russeted and sometimes with outspreading russet rays; calyx small, closed or partly open; lobes narrow, acuminate; basin small, shallow to deep, narrow, abrupt, often furrowed and wrinkled; skin smooth, pale yellow overspread with bright red, striped and splashed with carmine; dots small, pale yellow or russet; calyx-tube small, cone-shaped, with fleshy pistil point projecting into the base; stamens median; core small, axile; cells symmetrical, closed; core-lines clasping; carpels elliptical, sometimes tufted; seeds large, plump, wide, often angular, very dark brown, sometimes tufted; flesh yellow, firm, fine-grained, crisp, very tender, juicy, sprightly, aromatic, pleasant subacid; very good; October to March.

MILAM. *Blair. Thomas.* Milam is a late winter apple very similar to Ralls, differing chiefly in its more highly colored fruits. It is grown only in the South and Middle West, in some sections of which it is a favorite for home use. Its origin is not known, but it has been grown since the middle of the nineteenth century. Formerly, the variety was propagated chiefly from sprouts, which spring up very freely.

Tree vigorous, upright-spreading, dense, with long, slender, curved branches. Fruit small to medium, round-conic to short-ovate, regular, not ribbed; stem pubescent, medium to long, slender; cavity acute, deep, wide, smooth and green or partly covered with thin russet; calyx pubescent, closed; basin medium in size, abrupt, shallow, narrow to medium in width, gently furrowed; skin thin, tender, smooth, yellow, marbled and striped with dull red, deepening to crimson in the sun; dots numerous, conspicuous, gray, often areolar, with russet

point; calyx-tube conical, with short, truncate cylinder; stamens basal; core small, axile; cells symmetrical, closed; carpels elongated, obovate, mucronate, tufted; seeds plump, acute, tufted; flesh yellow, coarse, crisp, tender, juicy, mild subacid; good; November to January.

MILDEN. *Milding.* By reason of handsome fruits of good quality, Milden has won a place in New England which it seems likely to retain both for home and commercial plantings. The apples are bright red on a pale-yellow background, of large size, and shapely in form. They are good, at least, in quality, and to many the subacid flavor is very agreeable. The trees are vigorous from start to maturity and come in bearing young, after which they yield a large crop biennially. Milden originated at Alton, New Hampshire, about 1865.

Tree large, vigorous, upright, dense. Fruit large, uniform in size and shape, oblate, sometimes conic, regular, often faintly ribbed, sides sometimes unequal; stem short, pubescent; cavity acute, deep, wide, symmetrical or furrowed, often russeted and with outspreading russet rays; calyx large, pubescent; lobes long, acuminate, closed or partly open; basin obtuse, shallow, wide, often compressed or furrowed; skin waxy, thin, tough, mottled with bright red and striped and splashed with carmine over a pale yellow background; dots inconspicuous, few, gray or russet; calyx-tube large, cone-shape, meeting the core; stamens median; core distant, medium in size, abaxile; cells symmetrical, open; core-lines clasping; carpels round to ovate, acuminate, emarginate, tufted; seeds variable in size and shape, narrow, obtuse, often abortive; flesh yellow, firm, crisp, breaking, coarse, very juicy, subacid; good; November to February.

MILWAUKEE. Milwaukee is a seedling of Oldenburg which it resembles in tree and fruit. It is not so good an apple as its parent, and deserves a place in pomology only because the crop matures late—from one to three months later than Oldenburg. It originated from seed sown by George Jeffrey, Milwaukee, Wisconsin, late in the last century. The variety is planted only where apples must brave the cold of northern winters, and even in such regions it is still on probation.

Tree vigorous, open, upright-spreading with laterals inclined to droop; branches long, slender, crooked. Fruit large, uniform in size and shape, oblate, regular or obscurely ribbed, sides often unequal; stem pubescent, short; cavity large, acute, deep, broad, furrowed, russeted and with outspreading brown-russet rays; calyx pubescent, large, leafy, partly open, sometimes closed; lobes wide, long, acute; basin large, often oblique, deep, wide, abrupt, furrowed, wrinkled; skin thin, tough, smooth, glossy, pale yellow blushed with red, conspicuously mottled and striped with carmine; dots numerous, small, white, often submerged, occasionally russet; calyx-tube urn-shaped, with short cylinder and wide limb; stamens median; core distant, abaxile, small; cells unsymmetrical, closed or open; core-lines clasping; carpels elliptical to round-obcordate, mucronate; seeds few, often abortive, short, wide, flat, obtuse; flesh yellow, firm, coarse, crisp, tender, juicy, sprightly, brisk subacid; fair to good; season, November to March.

MINKLER. *Brandywine.* Two characters make Minkler more or less popular in the Corn Belt of the Middle West; the trees are vigorous and they bear large crops. The apples are attractive in appearance and keep very well in common storage but scald badly in cold storage; the quality is distinctly inferior. The variety is probably an old one renamed by S. G. Minkler of Illinois, about 1865.

Tree large, vigorous, spreading, becoming drooping; branches strong, forming a broad angle with the trunk and having a characteristically irregular, zigzag manner of growth. Fruit medium to large, uniform in size and shape, round to oblate-conic, regular; stem medium in length, slender; cavity acute, deep, green or brown, faintly russeted; calyx small, closed or open; lobes broad, acute; basin shallow, wide, obtuse, smooth or wrinkled; skin thin, tough, smooth, glossy, pale yellow, overspread with light red, obscurely striped and splashed with dull carmine; dots small, yellow, gray or russet, conspicuous; calyx-tube short, wide, funnel-form with broad limb and narrow cylinder; stamens median; core large, axile; cells closed or partly open; core-lines meeting or clasping; carpels round, usually deeply emarginate, tufted; seeds dark brown, large, long, plump or sometimes flat, acute, sometimes tufted; flesh yellow, firm, coarse, juicy, mild subacid, aromatic; good; November to April.

MISSOURI PIPPIN. *Missouri Orange. Missouri Keeper.* Missouri Pippin is one of the standard commercial apples in Missouri and neighboring states. The qualities which give it standing are: attractive appearance and long keeping quality in the fruit, and earliness, reliability, and heavy bearing in the trees. The apples are, however, but second-rate in quality and the trees are usually short-lived. The variety fails in the North and East. Missouri Pippin is said to have originated on the farm of Brinkley Hornsby, Kingsville, Missouri, from seed planted about 1840.

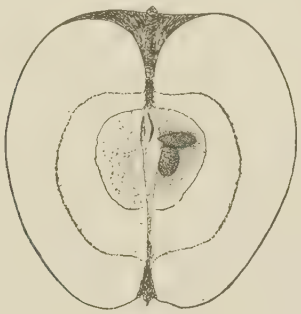
Tree vigorous, upright-spreading, with long, slender, curved branches, characteristic on account of its numerous, slender twigs. Fruit medium in size, round-conic; stem medium in length, slender; cavity acute, wide, deep, faintly russeted; calyx closed or nearly so; lobes long, narrow; basin medium to deep, wide, abrupt, wrinkled; skin thick, tough, smooth, glossy, thinly coated with bloom; color pale yellow overspread with bright red, striped with dark red, highly colored specimens almost solid red; dots conspicuous, russet, or large, pale gray; calyx-tube funnel-form with wide limb, sometimes broadly conical; stamens median; core small, axile, or nearly so; cells symmetrical, open; core-lines clasping; carpels smooth, round-elliptical, sometimes emarginate; seeds small, obtuse, dark brown; flesh yellow, firm, fine-grained, brisk subacid; fair to good in quality; October to January.

MONMOUTH. *Monmouth Pippin. Red Cheek. Red Cheek Pippin.* Monmouth is an apple of the Rhode Island Greening type, but its fruits are easily distinguished by a brighter cheek and a distinct flavor. The apples are handsomer than those of Rhode Island Greening, keep as well in common storage, and do not scald so badly in cold storage; but they are not so well flavored, and the crop runs more to low-grade fruit. The trees are hardy, long-lived, and productive; bear young, almost annually; and fall short only in vigor. This apple is a native of New Jersey and was first described in 1848. It is grown sparingly in all apple regions east of the Mississippi.

Tree of medium size, vigorous, spreading, open; branches short, stout, crooked. Fruit large, oblate to round, somewhat conic, flattened at the base, irregular, obscurely ribbed, sides often unequal; stem short, thick; cavity large, acute, deep, broad, furrowed or compressed, smooth or russeted; calyx large, leafy, pubescent, open or partly closed; lobes reflexed and separated at the base; basin large, wide and deep, abrupt, often distinctly furrowed and wrinkled; skin thin, tough, smooth toward the base, the upper half often roughened with

russet dots or with capillary russet lines which become concentric toward the calyx, green marbled with yellow or pale yellow blushed with lively red; dots variable, numerous, green and areolar, with brown-russet points, often elongated about the cavity; calyx-tube large, wide, conical, with fleshy pistil point projecting into the base; stamens median; core small, abaxile with hollow cylinder in the axis; cells symmetrical and closed; core-lines meeting or clasping; carpels round-obcordate, mucronate, tufted; seeds few, long, acute, tufted; flesh yellow, firm, coarse, crisp, tender, juicy, brisk subacid, becoming mild, aromatic; good to very good; November to February.

MOTHER. Fig. 36. Mother is one of the prized apples of old orchards, valued alike for its handsome appearance and its tender, rich, well-flavored flesh. It calls to mind the better-



36. Mother. (×½)

known Esopus Spitzenburg, but it is not quite so good an apple either for dessert or for cookery, falling short in flavor and keeping qualities. The trees are seldom satisfactory and should be top-worked on a more vigorous stock to obtain vigor and thrift. Mother was described first in 1848 from Worcester County, Massachusetts. It is very generally grown in all apple regions.

Tree small, slow grower, upright-spreading, open. Fruit large, uniform in size and shape, round, round-conic or oblong-ovate, obscurely and broadly ribbed; stem long, slender; cavity acute, shallow, broad, often russeted, sometimes furrowed, compressed or lipped; calyx small, closed or nearly so; lobes narrow, acute; basin shallow, narrow, abrupt, furrowed and wrinkled; skin thin, smooth, golden yellow covered with bright deep red, marbled and striped with carmine; dots inconspicuous, yellow, submerged; calyx-tube long, funnel-form with wide limb and narrow cylinder; stamens marginal; core small, abaxile; cells symmetrical, open or partly so; core-lines clasping; carpels broad-ovate to round, emarginate, mucronate; seeds dark, plump, acute; flesh yellow, fine tender, juicy, mild subacid, aromatic; very good to best; September to January.

MUNSON SWEET. *Meachem Sweet. Orange Sweet.* Munson is a sweet apple prominent in New York and New England a generation ago but now disappearing. It is supposed to have originated in Massachusetts early in the eighteenth century and was first described in 1849.

Tree large, vigorous, spreading, dense. Fruit large, round-oblate, often elliptical, ribbed; stem short, thick; cavity large, acuminate, narrow, unsymmetrical, russeted; calyx closed; lobes narrow, acute; basin shallow or very shallow, narrow, obtuse, furrowed, often unsymmetrical; skin thick, tough, separating readily from the flesh, smooth, greenish-yellow often blushed; calyx-tube funnel-shape with long cylinder; stamens marginal; calyx closed or open; core-lines clasping the cylinder; carpels round to elliptical, emarginate, tufted; seeds short, flat, obtuse, dark brown; flesh yellow, fine-grained, tender, juicy, sweet; good to very good; September to December.

NEWTOWN SPITZENBURG. *English Spitzenberg. Vandevere.* Possibly this apple is as well known under the name "Vandevere" as that here given it. This is not, however, the true Vandevere, and neither must it be confounded with Esopus Spitzenburg. Once in hand, the apples are most excellent—crisp and tender of flesh, and having a delectable, rich, aromatic flavor. But the trees are so unreliable in growth and bearing and so fastidious as to soils that the variety has no commercial value. It originated in Newtown, Long Island, and was first described in 1817.

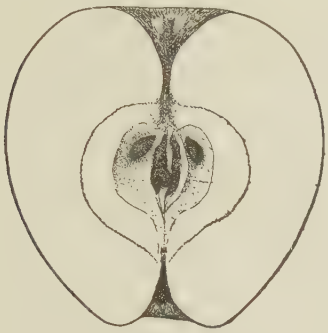
Tree medium to large, vigorous, spreading, dense, with long, stout, curved branches. Fruit of medium size, round-oblong or somewhat oblate, regular and uniform in shape and size; stem very short to long, slender, pubescent; cavity acute, deep, broad, indistinctly furrowed, sometimes russeted; calyx small, closed, sometimes partly open; lobes broad, obtuse; basin small, wide, shallow to deep, furrowed; skin smooth, tough, deep yellow blushed and mottled with dull red, striped with carmine, streaked with gray scarf-skin and overspread with light bloom; dots characteristic, conspicuous, very numerous, yellow, often with russet center, small, very numerous and crowded about the basin but less numerous, larger and irregular toward the cavity; calyx-tube cone-shape with short, truncate cylinder; stamens median; core small, abaxile; cells symmetrical and partly open; core-lines meeting or clasping; carpels smooth, elliptical; seeds numerous, large, narrow, plump, acute; flesh yellow, firm, fine-grained, crisp, tender, juicy, mild subacid, rich, aromatic; very good in quality; November to March.

NICKAJACK. *Chatham Pippin. Missouri Pippin. Missouri Red. Pound. Red Pippin. Red Warrior. Winter Horse.* This variety has long been held in high esteem in the South. The fruits keep remarkably well, but the quality is but second-rate; and, as generally grown, the apples are dull in color and unattractive. A long season is necessary for the full development of its fruit; therefore the variety cannot be grown in the North. The trees are vigorous and productive. The variety is supposed to have originated near a stream of the same name in Macon County, North Carolina, and was first described in 1853.

Tree large, very vigorous, upright-spreading. Fruit medium to large, uniform in size and shape, round-conic to round-oblate or rarely round-oblong, sides unequal, axis often oblique; stem short and thick; cavity acuminate, deep, broad, obscurely furrowed and partly covered with thin greenish-russet; calyx rather large, closed or open; lobes short, broad, acute; basin often oblique, shallow, medium in width, obtuse to abrupt, obscurely furrowed and wrinkled; skin thick, tough, smooth, glossy, yellow, mottled and shaded with orange-red or red, irregularly splashed and streaked over the base with scarf-skin and overspread with thin bloom; dots numerous, irregular in shape, very conspicuous, pale or russet; prevailing effect grayish-red; calyx-tube large, wide, short and urn-shaped or long funnel-form; stamens median; core large, axile; cells closed or partly open; core-lines clasping; carpels concave, broadly-ovate to round, tufted; seeds light to dark brown, short and wide, plump, acute, tufted; flesh yellow, very firm, coarse, crisp, tender, juicy, mild subacid becoming nearly sweet, aromatic; good; December to May.

NORTHERN SPY. Fig. 37. *Spy.* Delectable quality, great beauty in color and

form, and the fair size of the fruit, with hardiness, healthfulness, reliability in bearing, vigor and productiveness in the tree, make the Northern Spy one of the leading American apples. The fruits play an important part in commerce, having a well established reputation in all American fruit markets; they stand usage in shipping, storing, and marketing very well, after which they sell at highest prices. The trees bloom remarkably late and thereby often escape spring frosts; they are long-lived,



37. Northern Spy. (×½)

nearly perfect in form; and grow to maturity with rapidity from the nursery. The last three characters make them favorites upon which to graft less vigorous sorts. Northern Spy is not without faults, however. Those of the fruit are: the skin is thin and tender, making careful handling necessary; and when poorly grown, the flavor deteriorates. Other faults are: the trees are most capricious as to soils; come in bearing only after several years of care; and are an inviting prey to apple-scab, both fruit and foliage suffering. The Northern Spy tree is of largest size and must be given plenty of room in the orchard; it prefers a warm, fertile, well-drained, gravelly or sandy loam in a cool and somewhat moist climate. This excellent apple was grown from seeds planted by Heman Chapin about 1800 in East Bloomfield, New York. Long considered one of the best apples in New York and New England, its culture has spread westward to the Pacific.

Tree large, vigorous, upright, dense, becoming round-topped, with willowy, slender, drooping laterals; branches long, stout, curved. Fruit large, round-conical, sometimes oblong, flattened at the base, symmetrical, ribbed; stem thick; cavity large, acute, very wide and deep, broadly furrowed, usually with greenish-russet radiating upwards to the brim; calyx small, closed; lobes short, broad, obtuse; basin small, narrow, deep, abrupt, furrowed; skin thin, tender, smooth, glossy, the pale yellow ground-color nearly concealed with bright red, mottled and splashed with carmine and overspread with thin bloom; dots small, scattering, white, gray or russet; prevailing effect striped-red; calyx-tube large, long, narrow funnel-form with very narrow cylinder; stamens basal; core large, abaxile; cells symmetrical, open, often not uniformly developed; core-lines clasping the funnel cylinder; carpels concave, broadly round, emarginate, tufted; seeds small, wide, plump, obtuse, dark, tufted; flesh yellow, firm, fine-grained, tender, crisp, juicy, sprightly, aromatic, subacid; very good to best; November to April.

NORTHWESTERN GREENING. Fig. 38. Possessed of a constitution which enables it to endure as much cold as any other apple excepting, possibly, a few Russian sorts, Northwestern Greening has found a niche in the apple flora of the cold Northwest that it fills very well. The tree grows with rapidity and vigor, and while it does not bear early, eventually becomes a reliable and productive producer. The apples are mediocre in quality, and the flesh within the core-lines is often corky and discolored. Northwestern Greening

38. Northwestern Greening. (×½)

originated in Waupaca County, Wisconsin, and was first described in 1895. It plays an important part in the fruit-growing of Wisconsin and Minnesota.

Tree vigorous, upright-spreading, dense, with long, stout, crooked branches. Fruit large or very large, variable in size and form, round, oblong or oblate, often conic, more or less irregular, sometimes elliptical, sometimes ribbed; stem short; cavity small, acute, narrow, deep, often compressed or lipped, with outspreading russet; calyx variable, small, closed or open; basin small, narrow, abrupt, deep, furrowed and wrinkled; skin smooth, waxy, pale yellow, sometimes faintly blushed; dots small or large and irregular, usually white and submerged, sometimes gray with russet point; prevailing effect yellow; calyx-tube wide, conical or urn-shaped; stamens median; core large, axile; cells symmetrical, closed or open; core-lines meeting; carpels broadly round, mucronate; seeds small, often abortive; flesh yellow, crisp, firm, juicy, mild subacid; fair to good; November to April.

OAKLAND. *Oakland County Seek-no-further.* In Michigan, Oakland is prized in many orchards, but it seems not to be grown elsewhere. The apples, while not remarkable, are attractive and so pleasantly flavored that they elicit praise from all who taste them. The trees, though slow in growth, eventually make large specimens which bear abundantly but, as a rule, only biennially. The name commemorates the county in Michigan in which the variety is supposed to have originated. Oakland was first described in 1883.

Tree slow of growth, open, spreading, with long and stout branches. Fruit medium to large, uniform in size, round, usually somewhat oblate, sometimes conic, symmetrical, irregular, often obscurely angular or ribbed; stem slender; cavity acuminate, wide, deep, angular, sometimes lipped, often russeted and with some outspreading russet; calyx pubescent, small, closed; basin shallow, abrupt, compressed or furrowed; skin thin, tough, smooth, yellow blushed and mottled with dark red, striped with carmine and overspread with thin

bloom; dots light, sometimes mingled with flecks of russet; prevailing color dark red dulled by the bloom; calyx-tube small, narrow, funnel-form; stamens median; core small, abaxile with hollow cylinder at the axis; cells symmetrical, open or closed; core-lines clasping; carpels smooth, distinctly concave, elliptical, obtusely emarginate, mucronate; seeds numerous, variable, small, obtuse; flesh white, tender, fine-grained, juicy, sweet, crisp; good; November to March.

OHIO NONPAREIL. *Nonpareil. Red Bellflower.* This sort, once very popular in the Middle West, is now to be found only in old orchards. The tree is seldom satisfactory. It originated near Massillon, Ohio, and was first described in 1848.

Tree medium in size, spreading. Fruit medium to large, round-oblate, often obscurely ribbed; stem short and thick; cavity large, acute, deep, symmetrical, russeted, the russet sometimes spreading over the base; calyx closed or slightly open; lobes narrow, acute; basin small, medium in depth, wide, abrupt, symmetrical; skin yellow overspread with bright red, mottled and irregularly striped and splashed with carmine; dots numerous, small, areolar with russet center; calyx-tube short, conical; stamens basal; core small, abaxile; cells symmetrical, closed or open; core-lines meeting; carpels round, flat, tufted; seeds medium in size, long, plump, acute, tufted; flesh yellow, firm, fine, crisp, tender, juicy, agreeably subacid, aromatic; good to very good; October and November.

OKABENA. The fruits of Okabena are not attractive enough in appearance, nor good enough in quality for the great apple regions of the country, but the hardiness of the tree makes it a desirable variety for the northern part of the Great Plains. Okabena originated in 1871 near Worthington, Minnesota, from a seed of Oldenburg supposed to have been fertilized by Wealthy. The variety was introduced by the Jewell Nursery Company in 1892.

Tree of the Russian type, rather small, compact, very hardy, bearing almost annually, productive. Fruit of medium size, not uniform in size, round-oblate or sometimes slightly conical, symmetrical; stem long, slender; cavity acuminate, deep, broad, russeted, symmetrical; calyx closed, medium to large; basin shallow, wide, obtuse, almost smooth, symmetrical; skin rather thick, tender, light greenish-yellow overlaid with scattering stripes of light red; dots numerous, pale, submerged; core closed, with clasping core-lines, axile; calyx-tube narrow, funnel-shaped; stamens marginal; carpels round, emarginate; flesh tinged with yellow, sometimes with a trace of red, firm, tender, juicy, subacid; quality rather poor, suitable only for culinary purposes; season August and September.

39. Oldenburg. (×½)

OLDENBURG. Fig. 39. *Duchess. Duchess of Oldenburg.* Oldenburg, still one of the best general purpose apples of its season, was the first of the Russian apples, and inspired interest in a group of varieties which has made fruit-growing possible in the colder parts of America. The apples are handsome and well flavored, being especially suitable for culinary uses. The trees, while neither large nor long-lived and while quite susceptible to disease, come in bearing early, are hardy and productive, and are especially fitted for planting as fillers among permanent trees. The variety is preëminently an apple of commerce and thrives north and south, east and west, on many soils, but always requires good care. Oldenburg was imported from England to America in 1835.

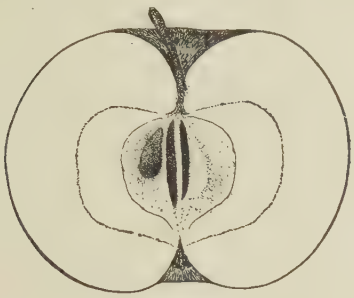
Tree medium in size, upright-spreading. Fruit medium to large, uniform in size and shape, round-oblate or oblate, regular, symmetrical; stem short, slender; cavity acute, deep, broad, usually partly covered with green-russet; calyx large, usually closed; lobes broad, acute; basin deep, wide, abrupt, smooth or with small mammiform protuberances; skin thick, tender, smooth, pale yellow, covered with irregular splashes and stripes of bright red, mottled and shaded with crimson; dots scattering, small, light colored; prevailing effect red-striped; calyx-tube long, wide, funnel-shape with broad truncate cylinder; stamens median; core large, axile; cells symmetrical, closed or open; core-lines clasping; carpels broad-ovate, emarginate; seeds large, wide, obtuse, plump, dark brown; flesh yellow, firm, fine, crisp, tender, juicy, sprightly subacid, aromatic; good to very good for culinary purposes; August and September.

OLIVER. *Oliver's Red. Senator.* Oliver has not generally received the attention which both fruit- and tree-characters justify. The apples are handsome in color, smooth of skin, shapely, and while not large are uniform in size. The quality is good, the flavor being pleasantly acidulous, eventually approaching sweet. The trees are hardy, vigorous, come in bearing young, bear abundantly, almost annually, and hold the crop well. The season coincides with that of Baldwin, being, if anything, a little longer. Oliver is supposed to have originated in northwestern Arkansas, and its cultivation is confined to that and neighboring states where long seasons insure full development. It was first described in 1893.

Tree medium in size, very vigorous, round-spreading; branches long, stocky. Leaves long and broad, thick, dark green. Fruit large, uniform in size and shape, round or oblate, symmetrical, regular, elliptical or obscurely angular, sides sometimes unequal; stem short to long; cavity medium to large, acute, deep, broad to narrow, regular, smooth, green or partly covered with greenish-russet, sometimes with outspreading russet rays; calyx large, open; lobes separated at the base, short, broad, obtuse, erect or reflexed; basin large, saucer-shape, wide and abrupt, sometimes shallow and obtuse, wrinkled; skin thin, tough, waxy, smooth or roughened with large russet dots, yellow, mottled and striped with red or nearly covered with bright deep red and splashed with carmine; dots conspicuous, numerous, gray or russet, large, often elongated or irregular about the cavity; calyx-tube obtusely cone-shaped; carpels round or elongated narrowing toward the base and apex, emarginate, mucronate, smooth; seeds irregular, large, numerous, completely filling the cells, long, wide, obtuse, dark brown; flesh yellow, fine and crisp, tender, breaking, juicy, sprightly subacid; good or very good; December to April.

ONTARIO. Fig. 40. In most of its characters, Ontario is an intermediate between its parents, Northern Spy and Wagener. The apple has the oblate shape and the prominent ribbing of Wagener, but the deep cavity and

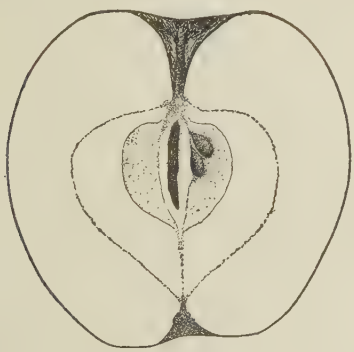
the color of Northern Spy. Usually the fruits are larger than those of either parent, but inferior in both color and flavor. Its season coincides with that of Northern Spy. At one time much heralded, Ontario has been widely



40. Ontario. (×½)

distributed, but is nowhere largely grown unless it be in Ontario, where it was produced, in the town of Paris, by Charles Arnold. It was first described in 1874.

Tree medium to large, vigorous, upright-spreading. Leaves long and large. Fruit large to very large, uniform in size and shape, oblate or round-conic, distinctly ribbed or angular, symmetrical; stem medium in length and thickness; cavity large, acute, deep, wide, often thinly russeted and with outspreading rays of russet; calyx small, closed or slightly open; lobes narrow, acute; basin small, deep, narrow, abrupt, often furrowed and wrinkled; skin thin, tough, smooth, pale yellow washed with brownish-red, splashed with carmine, in highly colored specimens bright red striped with carmine, often coated with white bloom and mottled and streaked with scarf-skin; dots numerous, small, white, gray or russet; calyx-tube narrow, funnel-form; stamens median; core small, abaxile with a large hollow cylinder at the axis; cells symmetrical, closed or open; core-lines clasping the funnel cylinder; carpels smooth, round, narrowing toward the apex, often truncate at the base, emarginate; seeds wide, obtuse, dark; flesh yellow, firm, fine, crisp, tender, juicy, sprightly, brisk subacid, aromatic; good to very good; November to March.



41. Opalescent. (×½)

OPALESCENT. Fig. 41. The outstanding character of Opalescent is beauty of product. The fruits are large, shapely, uniform in size, and nearly covered or sometimes quite covered with brilliant red on a yellow background —a veritable feast to the eye. The quality, while not the best, is good. The trees are hardy, vigorous, productive, hold their load well, and are remarkably free from insect and fungous pests. Opalescent is a comparatively new variety introduced about 1899 from Xenia, Ohio. It is so similar in tree and fruit to the well-known Twenty Ounce that one may well suspect it to be a sport or a seedling of the older sort. All characters mark it as a variety full of promise for regions in which Twenty Ounce thrives.

Tree vigorous, round-topped, open. Fruit large to very large, round-conic, symmetrical or with sides unequal, obscurely ribbed; stem short, slender; cavity large, acuminate, very deep, sometimes russeted, symmetrical or compressed; calyx small, partly open; lobes small, obtuse, reflexed; basin small, often oblique with the brim prominent on one side, narrow, deep, abrupt, sometimes furrowed; skin thick, tough, glossy, pale yellow overspread with dark deep red with scarcely perceptible streaks of carmine; dots numerous, small, red, yellow or russet, often submerged, frequently mingled with irregular lines and flecks of russet; prevailing effect brilliant red; calyx-tube small, cone-shape; stamens median; core small, abaxile; cells sometimes unsymmetrical, closed; core-lines meeting; carpels smooth, round or broadly obcordate; seeds acute, medium in size, form and color; flesh yellow, firm, tender, coarse, juicy, mild subacid, aromatic; good to very good; November to February or March.

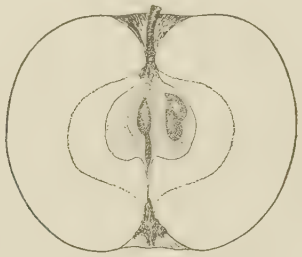
ORTLEY. *Golden Pippin. Greasy Pippin. Green Bellflower. Yellow Pippin.* Ortley is probably a seedling of Yellow Bellflower, surpassed in most respects by the better-known variety. The essential differences between the two are: the fruits of Ortley are paler in color and have less acidity than those of Yellow Bellflower, and the trees are less productive. Ortley is an old variety first described by Coxe in 1817. It is a favorite in the South, parts of the Middle West, and on the Pacific slope.

Tree vigorous, medium in size or large, with long slender shoots, when mature spreading. Fruit large, un-uniform in size and shape, oblong-conic and flattened at the base or round-conic, regular or obscurely ribbed; stem long, slender; cavity large, acute, deep, narrow, partly russeted, furrowed; calyx small, closed or open; lobes long, acute, usually converging and reflexed; basin small, shallow, narrow, abrupt and wrinkled or furrowed; skin thin, tough, smooth, waxy, yellow, rarely with a faint blush; dots inconspicuous, white and submerged; calyx-tube funnel-form, sometimes constricted at the base of the limb and enlarging below, often elongated and extending to the core; stamens median; core large, widely abaxile; cells symmetrical and wide open, sometimes closed; core-lines clasping the funnel-like cylinder; carpels round-ovate, elongated, emarginate, mucronate; seeds numerous, small and pointed, round, plump, light brown; flesh yellow, fine, crisp, tender, juicy, sprightly; very good; October to January.

PALOUSE. Palouse is supposed to be a seedling of Tompkins King, which it closely resembles in tree and fruit. The apples of parent and offspring are much alike in color, texture, flavor, and aroma, but those of Palouse are more oblong and do not keep so long. The variety is a comparatively new candidate for pomological honors and comes from Whitman County, Washington. Palouse is being planted only in the Pacific Northwest.

PARAGON. Fig. 42. Paragon is probably a seedling of Winesap, which it greatly resembles in tree and fruit. It is not easily distinguished, either, from Arkansas, which is also thought to be an offspring of Winesap.

The variety thrives only in regions where Winesap grows well, and is for most purposes inferior to the older sort. Paragon originated on the farm of Major Rankin Toole, Fayetteville, Tennessee, from a seed planted about 1830.



42. Paragon. (×½)

Tree vigorous, round-spreading, inclined to droop, dense, with short, stout, twisted branches. Leaves broad. Fruit medium or large, uniform in size and shape, round or sometimes oblate, slightly conic, rounding toward stem and calyx, sides often unequal; stem medium in length and thickness; cavity obtuse, shallow to wide and deep, symmetrical, often furrowed or compressed, occasionally lipped, russet and with outspreading russet rays; calyx small, closed; basin shallow, obtuse, often furrowed and wrinkled; skin tough, smooth, yellow, covered with dull red and indistinctly striped with darker red; dots gray or white, small, sometimes conspicuous; prevailing effect dark red; calyx-tube small, conical; stamens median; core small; cells partly open; core-lines clasping; carpels concave, round varying to cordate, emarginate; seeds large, long, acute, dark, often abortive; flesh yellow, firm, coarse, tender, juicy, mild subacid, aromatic; good to very good; January to May.

PARRY WHITE. *Imperial White. Superior White. White Apple.* The fruit of Parry White is unique in the coloring of both skin and flesh, the former being pale yellow or waxen and the latter pure white. The crop ripens early, following Yellow Transparent closely. The variety does not come up to the mark now set for apples, and will probably never be largely grown. It is supposed to have originated in Pennsylvania about the close of the Civil War, and its culture is confined to that state, New Jersey, and Delaware. It was first described by Downing in 1872.

Tree of medium size and vigor, upright-spreading, somewhat drooping, dense. Fruit medium to large, uniform in size and shape, globular, oblate or ovate, regular; stem short, slender; cavity acuminate, medium in depth and width, smooth, symmetrical; calyx small, closed; lobes narrow, acute; basin very shallow, narrow to broad, obtuse, smooth or wrinkled, symmetrical; skin thick, tough, pale waxen-yellow, occasionally blushed; dots small, pale, numerous, depressed; calyx-tube short, narrow, funnel-shape; stamens marginal; core small, abaxile; cells open; core-lines meeting or clasping; carpels round, emarginate; seeds acute, light brown; flesh white, firm, fine, tender, juicy, subacid; good; late August through October.

PATTEN. *Patten Greening.* Patten is a seedling of Oldenburg, which it resembles in shape and flavor of fruit and in tree-characters. The color of the fruit, however, is green. The variety is much grown in cold regions where the apple-list is short. Patten originated from seed of Oldenburg planted by C. G. Patten, Charles City, Iowa, about 1885.

Tree vigorous, spreading, dense, flat, with long, stout, curved, drooping branches. Fruit medium to large, uniform in size and shape, oblate or round-oblate, sometimes conic, usually regular, symmetrical; stem short, thick; cavity acuminate, deep, broad or compressed, russeted and with outspreading russet rays; calyx large or very large, closed or open; basin deep, medium in width, abrupt, usually smooth and symmetrical; skin thin, tough, smooth, pale greenish-yellow, sometimes blushed and occasionally faintly striped; dots small, numerous, pale and submerged; calyx-tube conical; stamens median; core small, axile or abaxile; cells symmetrical, closed or partly open; core-lines clasping; carpels round, irregular; seeds dark brown, plump, obtuse; flesh yellow, firm, coarse, tender, juicy, sprightly subacid; good; October to January.

PECK PLEASANT. *Peck.* This old favorite is still one of the standards of its season to gauge choicely good apples. The tender-fleshed, perfumed fruits, pleasantly flavored, beautiful and unique in color—waxen yellow with an orange or pinkish blush—please all the senses through which apples are appreciated. The trees, unfortunately, have many faults, being subject to root-rot and canker and seldom bearing large crops or a high percentage of first-class fruit. Peck Pleasant is distinctly a fruit for family use, and the many spreading, lichen-covered ancients of this old sort to be found in the dooryards and farm orchards of New York and New England are testimonials to the esteem in which lovers of fruit hold it. The variety originated in Rhode Island early in the nineteenth century.

Tree medium in size, vigorous, upright-spreading or round, dense. Fruit medium to large, variable in size, oblate or round, sometimes conic, often ribbed or irregularly elliptical, sometimes with furrow on one side; stem short, thick or fleshy; cavity obtuse, wide, shallow, often lipped or compressed, sometimes russeted; calyx pubescent, large; lobes long, open or closed, sometimes separated at the base, obtuse; basin broad, obtuse, symmetrical, furrowed or wrinkled; skin thick, tough, smooth, waxen yellow with orange-red blush; dots numerous, white and submerged or with russet point; core small, abaxile to axile; cells usually closed or slit; core-lines clasp the funnel cylinder; carpels tender, broadly round, often truncate, emarginate, mucronate; seeds numerous, dark, long, narrow, acute, sometimes tufted; flesh yellow, firm, tender, crisp, fine-grained, juicy, pleasant subacid, aromatic; very good to best; October to January.

PEERLESS. Peerless has been tested in nearly all of the apple-growing sections of the United States, and, in nearly all, discarded. However, the capacity of the trees to endure cold and blight and their great productiveness make it desirable in some regions. It seems to be more popular in Canada and the Middle West than elsewhere. Peerless originated with J. G. Miller, Rice County, Minnesota, in 1867.

Tree vigorous, healthy, productive, hardy. Fruit medium to large, yellowish-green with stripes and splashes of carmine; flesh yellowish-white, fine-grained, subacid, agreeable but not rich; quality fair to good; October to March.

PENNOCK. *Big Romanite. Pennock's Red Winter. Phœnix. Red Pennock. Romanite.* This old sort was at one time a familiar inhabitant of Pennsylvania and New York and was widely distributed, though not largely planted, in other apple regions. Its outstanding characters are: for the fruit, large size, dull red color, oblique axis, yellow flesh, and distinct flavor; for the trees, hardiness, longevity,

and vigor. The variety fails because of the poor quality of the fruit and its susceptibility to a physiological trouble known as "Baldwin spot." Pennock appears to have originated on the farm of Joseph Pennock, Delaware County, Pennsylvania, about 1800. The earliest account of it is that of Coxe in 1817.

Tree large, vigorous, regular, symmetrical, upright-spreading. Fruit large, uniform in size and shape, round to oblate or oblong, often conic, sometimes obscurely ribbed or elliptical, axis oblique; stem short, thick, not exserted; cavity medium in size, acute, narrow to broad, deep, symmetrical, green or russeted, sometimes with outspreading russet rays; calyx large, closed or partly open; lobes long, acute, connivent or varying to flat and convergent, pubescent; basin shallow, narrow, abrupt, sometimes obtuse, often furrowed or wrinkled; skin thick, tough, smooth, yellow, washed and mottled with red, indistinctly striped with carmine and mottled and streaked with thin scarf-skin; dots numerous, conspicuous, large, gray or yellow, often areolar with russet point; calyx-tube large, wide, conical; stamens basal; core small, axile; cells uniformly developed, closed; core-lines meeting; carpels ovate to round-obcordate, emarginate, sometimes tufted; seeds large, narrow, long, plump, acute, rarely tufted; flesh yellow, firm, coarse, crisp, tender, juicy, subacid to mild subacid; fair to good; December to April or May.

PETER. Peter is a seedling of Wealthy, which outwardly in fruit it closely resembles. The two apples differ in quality, in season, in color of flesh, and in the seeds, those of Peter being larger. Peter serves the same purposes and is adapted to the same conditions as its well-known parent. The variety was grown by Peter Gideon, Excelsior, Minnesota, and was first distributed in 1886.

Tree large, upright-spreading, with stout, drooping branches. Fruit medium or large, uniform in size and shape, oblate or round-oblate, conic, regular; stem long, sometimes short, slender; cavity acuminate, deep, broad, compressed, russeted or smooth; calyx small, closed; lobes broad, acute; basin deep, narrow, abrupt, gently furrowed, sometimes compressed; skin thin, tough, smooth, pale yellow washed and mottled with red, conspicuously striped and splashed with deep carmine; dots scattering, brown, or white and submerged; prevailing effect red or striped-red; calyx-tube small, funnel-shape; stamens median; core usually axile; cells symmetrical, closed or partly open; core-lines clasping; carpels round, emarginate; seeds large, wide, long, flat, acute; flesh yellow, sometimes stained with red, firm, medium-grained, tender, juicy, with a pleasant, mild subacid, aromatic flavor; good to very good; September and October or later.

PEWAUKEE. Pewaukee is unusual in its fruits, which are distinguished by bluish bloom, characteristically rounded basal end, and a short stem inserted under a large lip. The apples can scarcely be said to be attractive in color—green striped with dull red; nor in shape—oblong and not uniform; nor, least of all, in the flesh, which is coarse in texture and austere in flavor. The trees, however, have health, vigor, longevity, early bearing, great productiveness, and remarkable hardiness to commend them. Pewaukee is a cross between Northern Spy and Oldenburg made by George F. Peffer, Pewaukee, Wisconsin, who brought the variety to the attention of fruit-growers about 1870. It is grown only where hardiness is a prime requisite.

Tree vigorous, large, upright-spreading or round, open, with stout, curved branches. Fruit large, uniform in size but not in shape, round-oblate, sometimes round-ovate, characteristically rounded toward the cavity, ribbed, more or less irregularly elliptical; stem short, often fleshy, inserted under a lip; cavity large, sometimes scarcely developed, narrow, very shallow, often furrowed and sometimes thinly russeted; calyx large, open or closed; basin medium in depth and width, usually abrupt, wrinkled; skin smooth, thin, tough, yellow washed and mottled with orange-red or red, striped and splashed with carmine, covered with bloom; dots conspicuous, pale gray or white, some large, obscurely defined and areolar; calyx-tube funnel-form; stamens median; core large, axile to abaxile; cells irregularly developed, usually closed or slit; core-lines clasping the funnel cylinder; carpels obcordate, tufted; seeds numerous, large, long, narrow, acute, plump, tufted, light brown; flesh white, firm, coarse, tender, very juicy, subacid, aromatic; fair to good; November to April.

PLUMB CIDER. The hardiness and productiveness of this variety commend it to the fruit-growers of Wisconsin—it is little known elsewhere. The variety was taken from Ohio to Wisconsin in 1844, but what its history otherwise may be does not appear.

Tree vigorous, very hardy, healthy, productive, long-lived. Fruit large, round-ovate, sometimes conic; stem stout, short; cavity shallow, narrow; calyx small, closed; basin narrow, shallow, plaited; skin yellow shaded with pale red and striped with brighter red; dots few, fine, gray; calyx-tube long, narrow, funnel-form; stamens marginal, touching the segments, a marked characteristic; core large; cells open; core-lines clasping; carpels cordate; seeds pale brown, short, plump, pointed; flesh greenish, firm, fine, breaking, juicy, brisk subacid; good; October to January.

POMME GRISE. *French Russet. Gray Apple. Grise.* The fruit of Pomme Grise is handsome and delectable, distinguished by small size, golden russet color, and crisp, tender, fine-grained, sprightly, aromatic flesh. The trees are hardy, healthy, and annually produce fruit in great abundance. Trees and fruit reach full development only in northern latitudes. The variety had its origin and finds greatest favor among the French in the valley of the St. Lawrence. It has been cultivated more than a century in Canada.

Tree vigorous, dense, round or spreading. Fruit small, uniform in size and shape, oblate, sometimes conic, ribbed, symmetrical; stem slender, pubescent, often bracted and streaked with reddish-brown; cavity large, obtuse, deep, wide, often compressed or gently furrowed; calyx small, closed; lobes long, narrow, acuminate, pubescent; basin variable, pubescent, saucer-shaped, narrow, shallow, obtuse, furrowed; skin thick, tough, yellow covered with russet, the cheek often smooth and yellowish-brown, mottled and striped with red; dots gray or white, scattering and inconspicuous; calyx-tube cone-shaped; stamens basal; core abaxile; cells symmetrical, closed or partly so; core-lines clasping; carpels round, narrowing toward the apex, emarginate, mucronate, smooth or tufted; seeds plump, irregular, obtuse, tufted; flesh yellow, firm, crisp, fine-grained, juicy, rich, subacid, aromatic; very good to best; November to April.

PORTER. *Summer Pearmain.* A generation ago Porter took rank as one of the best of all yellow fall apples. If the fruits be judged by quality, the variety would still rank as one of the best of its season, but the apples are too tender in flesh to ship, the season of ripening is long and variable, and the crop drops badly. Porter must remain, then, an apple for the connoisseur, who will delight in its crisp, tender, juicy, perfumed flesh, richly flavored and sufficiently acidulous to make it one of the most refreshing of all apples. Por-

ter originated about 1800 with Rev. Samuel Porter, Sherburne, Massachusetts. The variety is planted more or less wherever apples are grown in the United States.

Tree large, vigorous, round or spreading. Fruit usually large, oblong-conic, truncate at base and with apex oblique and ribbed; stem short, thick, sometimes knobbed, curved; cavity acute, deep, narrow, symmetrical or compresesd, sometimes lipped, usually faintly russeted; calyx large, closed or open; lobes usually separated at base, short, narrow, acute; basin deep, shallow, narrow, abrupt, broadly furrowed and wrinkled; skin thin, smooth, glossy, yellow with faint blush, usually obscurely striped with darker red, marked with scattering red dots; dots small, submerged, green with white center, sometimes russet; calyx-tube short, wide, broadly conical; stamens median; core large, axile or abaxile; cells partly open or wide open; core-lines meeting; carpels broadly ovate, mucronate; seeds medium to large, plump, rounded, acute; flesh yellow, fine, crisp, tender, juicy, subacid, agreeably aromatic, sprightly; good to very good; September to November.

POUND SWEET: See Pumpkin Sweet.

PRIMATE. Fig. 43. *Harvest. July Apple. Sour Harvest. Sour Bough.* Primate is another choicely good fall apple, preceding Porter in season, and so different in most characters as

43. Primate. (×½)

to be hardly a rival. By many it is considered the best variety of its season, by reason of high quality of fruit and trees that grow vigorously and bear reliably and abundantly. The variety fails in commercial plantations because the crop ripens over a period of several weeks. Unfortunately, the trees are inviting prey to the canker-fungi, because of which they are often short-lived. The variety is a welcome addition in every home orchard to precede Porter. Primate grew as a seedling on the farm of Calvin D. Bingham, Camillus, New York, about 1840.

Tree large, vigorous, upright-spreading, dense. Fruit medium, sometimes large, round-conic or oblate-conic, often distinctly ribbed; stem short, thick; cavity acute, deep, broad, furrowed; calyx closed; lobes long, narrow; basin shallow, medium in width, abrupt, furrowed and wrinkled; skin thin, tender, smooth, light green or yellow, blushed but not striped; dots scattering, numerous, small, submerged or russet; calyx-tube large, long, broadly conical; stamens median; core large, axile or abaxile with hollow cylinder in the axis; cells symmetrical, open; core-lines clasping; carpels cordate; seeds large, wide, plump, acute; flesh white, fine, crisp, very tender, juicy, subacid, aromatic, sprightly; very good to best; August and September.

PUMPKIN RUSSET. *Pumpkin Sweet. Pumpkin Sweeting. Sweet Russet.* This old sort, formerly a great favorite in New England, is hardly surpassed in tree-characters, but the apples are so coarse as to be fit only for cooking, and are none too good for culinary purposes. The variety has been grown in New England for a century. It seems to have been described first in 1832.

Tree large, vigorous, round or spreading, open; branches long, stout, curved. Fruit large, uniform in size and shape, oblate or conic, sometimes irregular, faintly ribbed, often compressed; stem short, slender; cavity acute; basin small, shallow, medium in width, abrupt, furrowed and wrinkled; skin thick, tough, pale yellow, sometimes with bronze blush on cheek, covered with russet patches or netted veins of russet; dots large and small, scattering, russet, irregular; calyx-tube short, wide, broadly conical; stamens median; core medium, abaxile; cells usually open, symmetrical but not uniformly developed; core-lines clasping; carpels broadly ovate, emarginate, sometimes tufted; seeds light brown, large, wide, flat, acute; flesh greenish-white, firm, coarse, tender, juicy, sweet; good; September and October.

PUMPKIN SWEET. Fig. 44. *Pound Sweet. Rhode Island Sweet. Vermont Sweet.* Pumpkin Sweet is the standard sweet apple of its season. The fruits are esteemed for baking,

44 .Pumpkin Sweet. (×½)

canning, and stewing, but are too coarse and not delicately enough flavored for dessert. The crop holds up well both under handling and in storage. In the markets, especially in New York, the variety is generally known as Pound Sweet. The trees are very satisfactory from every point of view excepting hardiness, as they suffer both from winter-injury and from sun-scald. This variety has been much confused with other sweet apples, but can be distinguished from similar sorts by its large fruits, of greenish-yellow color, sometimes bronzed on the cheek, but never marked with red nor with russet except about the cavity. It originated in the orchard of S. Lyman, Manchester, Connecticut, early in the nineteenth century. It is rather widely distributed in the United States.

Tree large, vigorous, upright-spreading, open, with long, stout branches. Fruit large or very large, uniform in size and shape, globular or round-conic, sometimes irregularly elliptical or prominently ribbed; stem very short, stout, often inserted under a lip or having a fleshy protuberance; cavity acuminate, deep, narrow, often furrowed or lipped, sometimes russeted; calyx large, open; lobes separated at the base, short, broad, acute; basin small, deep, narrow, abrupt, often furrowed or wrinkled; skin thin, tough, smooth, yellow marbled with greenish-yellow, with stripes of white scarf-skin

radiating from the cavity, sometimes with a brownish-red blush but never red; dots conspicuous, white, often areolar with russet center; calyx-tube wide, conical; stamens median; core large, axile; cells symmetrical, closed or open, not uniformly developed; core-lines clasping; carpels thin, broadly round, but slightly emarginate if at all, often tufted; seeds small, wide, plump, acute, light brown, tufted; flesh yellow, firm, crisp and juicy, sweet with a peculiar flavor; good; October to January.

RALLS. *Genet. Geneton. Genneting. Janet. Ralls Genet. Winter Genneting.* Ralls is a southern apple, but its good characters have enabled it to gain a foothold in parts of the North and West as well. The apples are not large, nor are they attractive in shape or color; but they are excellent in quality, and this has given the variety high place in the South, particularly in regions where the poorly flavored Ben Davis and York Imperial are the chief commercial apples. The young trees annually bear large crops of apples of fair size, but the old trees are biennial in bearing, and the apples, though borne in great abundance, are small. The variety is noted as one of the latest to bloom, so that it often escapes unfavorable weather at blooming time. The origin of Ralls is not known, but it first came to the notice of fruit-growers about 1800 on the farm of Caleb Ralls, Amherst County, Virginia.

Tree of medium size, vigorous, upright-spreading, inclined to droop, dense. Fruit medium in size, uniform in size and shape, round-oblate or round-conic, symmetrical; stem long and slender; cavity obtuse, deep, sometimes compressed or furrowed, often russeted; calyx small, open; basin often oblique, wide, shallow, abrupt, wrinkled; skin smooth, yellow blushed and mottled with red, indistinctly striped with carmine, overspread with light bloom which with broken stripes of thin scarf-skin gives the fruit a dull appearance; dots numerous, small, white or russet; calyx-tube broad cone-shape; stamens marginal; core axile or abaxile; cells closed or partly open; core-lines meeting or clasping; carpels flat, broadly round, emarginate, tufted; seeds narrow, plump, acute, dark; flesh white, firm, fine-grained, crisp, tender, juicy, subacid, aromatic, pleasant; very good; November to April.

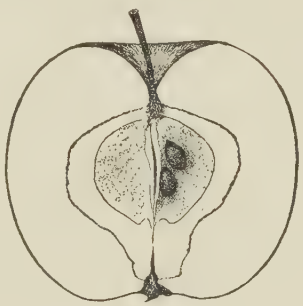
RAMBO. *Fall Romanite. Gray Romanite. Large Rambo. Striped Rambo.* Externally, the fruit of Rambo is almost a counterpart of that of the better-known Domine. The flavor and the season of the two apples, however, is quite distinct. Rambo is a mildly and richly flavored late autumn apple, while Domine is much more sprightly in flavor and is a long-keeping winter apple. The trees of Rambo are doubtfully hardy, with wood so brittle as often to break under heavy loads. The variety has never taken a prominent place among commercial apples, and is surpassed for home use by several of its orchard associates. Its origin is unknown, but Coxe, in 1817, noted that it was much grown in Delaware, Pennsylvania, and New Jersey—whence it spread westward to parts of the Mississippi Valley, in many localities of which it is still a favorite fruit.

Tree of medium size, vigorous, upright-spreading, open, the old bark peculiarly rough. Fruit medium in size, uniform in size and shape, round-oblate or round-oblong, symmetrical, usually regular but sometimes faintly ribbed; stem short, slender; cavity regular, wide, deep, acute, usually with outspreading russet; calyx small, usually closed; lobes narrow, acute; basin wide, deep, abrupt, often furrowed and wrinkled; skin thin, tough, smooth or roughened with russet dots, pale yellow, mottled with red, striped with carmine and overspread with gray bloom; dots conspicuous, large, white, gray or russet; calyx-tube funnel-form, long with wide limb; stamens median; core small, axile; cells closed; core-lines clasping; carpels round to broadly obovate, emarginate, tufted; seeds large, broad, flat, obtuse, tufted, light and dark brown; flesh yellow, firm, fine, crisp, tender, juicy, mild subacid, aromatic; good to very good; October to December or January.

RAMSDELL SWEET. *Hurlbut. Ramsdell's Red. Red Pumpkin Sweet.* Ramsdell Sweet was once popular because of the handsome red color and good quality of the apples, which, however, are not uniform in size or shape. The trees are not fruitful enough to give the variety value for commercial plantations. Ramsdell Sweet was brought to notice by Rev. H. S. Ramsdell, Thompson, Connecticut, about 1838. Its culture is confined to the East and North.

Tree vigorous, upright, open. Fruit medium or large, variable in size, uniform in shape, oblong-conic or round-conic, often elliptical and faintly ribbed; stem short, slender, often red; cavity acuminate, deep, broad, symmetrical, often russeted; calyx small, closed or open; lobes narrow, abrupt, faintly furrowed and wrinkled; skin thin, tough, smooth, yellow, overspread with dark red, with obscure splashes and stripes of carmine, overspread with bloom; dots many, distinct, conspicuous, large, pale yellow or gray, often submerged; prevailing effect red; calyx-tube large, long, cylindrical; stamens median; core small, axile or abaxile; cells symmetrical but not uniformly developed, closed or open; core-lines clasping; carpels ovate; seeds small, narrow, plump, acute; flesh yellow, firm, fine, tender, juicy, sweet; good to very good; October to February.

RED ASTRACHAN. Fig. 45. Red Astrachan is the standard red summer apple for home orchards in the United States and Canada, not because it is best in any of its char-



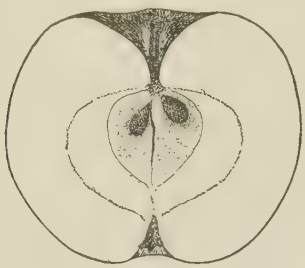
45. Red Astrachan (×½)

acters, but because it is considerably above the average in all. The apples are beautiful in color and shape when well grown, but are often poorly colored and lacking in uniformity of size and shape. They are fit for cooking long before maturity, and, when fully ripe, are fair for dessert, having a long season of usefulness. The trees come into bearing young and bear regularly and abundantly, but are short-lived and subject to most of the ills that apple-trees are heir to. The apples cannot be handled or stored, and, therefore, the variety has small place as a market fruit. Red As-

trachan is a Russian apple introduced into America in 1835, and has long been grown in all of the apple regions of America.

Tree large, vigorous, upright-spreading, dense. Fruit medium to large, not uniform in size or shape, round-oblate, conical, ribbed, sides unequal; stem slender, bracted; cavity acute, deep, broad, often russeted with greenish-russet, usually symmetrical, sometimes lipped; calyx large, open, or closed; lobes long, broad; basin shallow, narrow, obtuse, wrinkled; skin thin, tender, smooth, pale yellow often overspread with light and dark red, splashed and irregularly striped with deep crimson or carmine and covered with heavy bloom; dots numerous, white; calyx-tube long, funnel-form; stamens median; core small, abaxile; cells closed or open; core-lines clasping; carpels broadly ovate, tufted; seeds small, wide, plump, obtuse; flesh white often tinged with red, fine, crisp, tender, juicy, brisk subacid, aromatic, sometimes astringent; good to very good; late July to September.

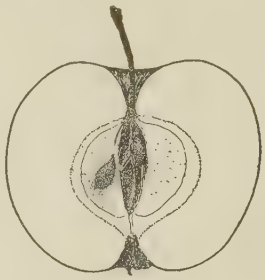
RED CANADA. Fig. 46. *Canada Red-streak. Red Winter. Steele's Red.* Were the trees as satisfactory as the fruit, Red Canada would take high rank among the commercial apples of the country. The apples are characterized by firm, crisp, fine-grained, juicy, aromatic, richly flavored flesh; they are medium to large, shapely, uniform in size and shape, and colored a beautiful fine, deep red, striped with deeper red on a background of yellow, the whole surface being conspicuously marked with large fawn-colored dots. The trees, however, signally fail; they are precariously hardy, lack in vigor, subject to most of the troubles that apple flesh is heir to, fastidious as to soils, and seldom sure or annual bearers. Red Canada probably originated in New England a hundred or more years ago, and has been most largely planted in New England, New York, and Michigan.



46. Red Canada. (×½)

Tree medium to large, vigorous, upright; branches short, stout, curved, crooked. Leaves broad, thin. Fruit medium to large, uniform in size and shape, round-conic, flattened at the base, symmetrical and regular, sometimes elliptical or obscurely ribbed and with sides a little unequal; stem slender, pubescent; cavity large, acuminate, deep, wide, often russeted and with radiating green or russet rays, symmetrical, sometimes furrowed; calyx small, closed or partly open, pubescent; basin small, narrow, shallow, abrupt, furrowed and sometimes wrinkled, often oblique; skin tough, smooth toward the cavity, rough about the basin, light yellow overspread with a deep red blush, indistinctly striped with deeper red; dots conspicuous, gray or fawn colored, towards the cavity scattering, large and elongated but towards the apex more numerous and smaller; prevailing effect deep red; calyx-tube elongated-cone-shape; stamens marginal; core sessile, axile, small; cells symmetrical, closed or slit; core-lines clasping; carpels smooth, round, narrowing toward the apex, mucronate; seeds numerous, large, angular, long, wide, plump, obtuse; flesh yellow, firm, crisp, fine-grained, tender, juicy, aromatic, rich, agreeably subacid; good to best; October to March.

RED JUNE. Fig. 47. *Carolina June. Carolina Red. June.* Red June is characterized by its small, deep red, round apples of uniform size and shape. The flesh is white, rimmed and stained with red, juicy, sprightly, refreshing, rich, and very good. The variety is grown in full perfection only in the South and parts of the West, though well worth growing as far north as the Baldwin is hardy, furnishing in the South an excellent summer apple and in the North a very good fall fruit. Red June is supposed to have originated in North Carolina, having been first described in 1848, though it is probably much older.

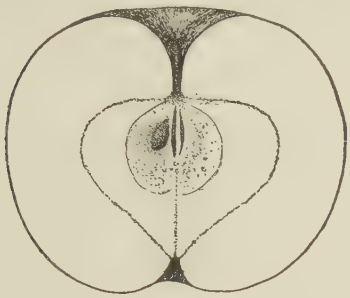


47. Red June. (×½)

Tree vigorous, spreading, with short, stout, curved branches. Fruit small, uniform in size and shape, round-ovate or oblong, regular, sides usually unequal; stem variable, usually long, slender; cavity small, acuminate, shallow, narrow, symmetrical, sometimes compressed; calyx large, leafy, closed or open; lobes long, narrow, acuminate; basin small, shallow, narrow, obtuse, smooth or wavy; skin thin, tender, smooth, glossy, pale yellow, overspread with deep red, very dark red on the exposed cheek; dots numerous, very small, light; calyx-tube short, wide, conical; stamens median; core large, axile or somewhat abaxile; cells symmetrical, open or sometimes closed; core-lines clasping; carpels broadly ovate; seeds dark brown, numerous, small, plump, acute; flesh white, fine, tender, juicy, brisk subacid; good to very good; July to October.

RHODE ISLAND GREENING. Fig. 48. *Rhode Island. Greening.* This is the favorite green apple of the continent. It ranks among the first half dozen commercial varieties of the country, and is to be found in as many home orchards as any other apple. Fruit- and tree-characters contribute in equal measure to its popularity. In color, the apples are a mellow shade of yellow with a dull blush or occasionally a pale red cheek—not showy but pleasing. The apples are substantially large, never coarse, in general symmetrically rotund, and very uniform in size and shape. The fruit ranks high among dessert apples, and for culinary purposes is unsurpassed. The flesh is tender, very juicy, and has the mellow, yellow tint of the skin. The flavor is rich but does not cloy, pleasantly acidulous, always refreshing, and as the apples ripen they develop a delightful aroma. The trees are of

largest size, have wide-spreading, drooping branches, rejoice in health and vigor, load themselves with fruit, and are long-lived. The faults of the fruits are that they bruise rather



48. Rhode Island Greening. (×½)

easily, are often disfigured by apple-scab, and scald badly in cold storage. The trees fail in not always holding their load well, in susceptibility to apple-scab, and in tenderness to cold. The variety is more fastidious to climate than to soil, refusing to flourish either in extreme northern or in southern apple regions. It prefers the fertile intervale lands of New York or Michigan, whether sandy loam or clayey loam, requiring always good drainage. The name commemorates the state of its nativity, but when and where in Rhode Island it first grew is not known. Its cultivation dates back nearly 200 years.

Tree large, vigorous, wide-spreading, drooping. Leaves large, broad, foliage dense. Fruit large or very large, uniform in shape and size, round or round-oblate, sometimes conic, regular or a little elliptical, sometimes obscurely ribbed, symmetrical or sides slightly unequal; stem medium in length, green, pubescent; cavity acute, medium in depth and width, symmetrical or rarely lipped, smooth, sometimes russeted and with narrow, outspreading russet rays; calyx large, closed, sometimes partly open, pubescent; lobes long, acute; basin small, shallow, obtuse, regular or furrowed; skin thick, tough, smooth, waxy, green or yellow, sometimes with brownish-red blush which rarely deepens to red; dots greenish-white or russet, especially numerous toward the basin and often submerged; prevailing effect green or yellow; calyx-tube wide, cone-shape with fleshy pistil point projecting into the base; stamens median; core small, abaxile; cells uniform, symmetrical, closed or partly open; core-lines meeting; carpels thin, flat, emarginate, round to round-cordate, sometimes tufted; seeds few, often abortive, large, narrow, long, acute, sometimes tufted; flesh yellow, firm, fine-grained, crisp, tender, juicy, rich, sprightly subacid; very good in quality; November to March.

RIBSTON. *Essex Pippin. Ribston Pippin.* Ribston is one of the few exotic apples worth growing in America. The apples are not attractive in appearance, but have a fine rich flavor, a pleasant aroma, and firm, fine, crisp flesh that fit them admirably for dessert. The trees are hardy, vigorous, and long-lived, come in bearing young, and are annually fruitful, though not sufficiently productive nor do they hold the crop well enough to make a market variety. Ribston originated in Yorkshire, England, over two centuries ago, and has been grown in America for at least a century, thriving best in New York, New England, and Canada.

Tree large, vigorous, upright-spreading, with stout, stocky branches. Fruit medium or large, uniform in size and shape, round, broad and flattened at the base, narrowing toward the basin, occasionally round-oblong, often broadly and obscurely ribbed; stem pubescent, short, occasionally slender, more often thick, sometimes irregularly swollen or inserted under a lip; cavity large, acute, deep, wide, sometimes furrowed or compressed, russeted and with outspreading russet rays; calyx variable, small, closed or partly open; lobes separated at the base, erect, tips usually reflexed; basin small, shallow, narrow, abrupt, or occasionally obtuse, often furrowed and wrinkled; skin smooth or roughened with russet, yellow overspread with dull red which in highly-colored specimens deepens to bright red, with obscure carmine stripes and splashes; dots scattering, conspicuous toward the base, more numerous and smaller toward the basin, pale, often areolar with russet center; calyx-tube wide, cone-shape; stamens basal; core small, axile or with a narrow, hollow cylinder at the axis; cells regular, closed; core-lines clasping; carpels elliptical, emarginate, tufted; seeds variable, some abortive, light and dark brown, large, wide, long, obtuse, sometimes slightly tufted; flesh yellow, firm, very crisp, juicy, pleasantly aromatic, rich, sprightly subacid; very good; September to December.

RICHARD GRAFT. *Red Spitzenberg. Strawberry. Wine.* Richard Graft is a product of the Hudson Valley, New York, and at present is grown only there. It is a fall apple, superior because choicely good in quality, but suitable for a home product only, as the crop ripens in a succession of several weeks. The trees are satisfactory except in bearing biennially. The variety was introduced in 1860 by E. G. Studley, Claverack, New York.

Tree of medium size, vigorous, upright, open. Fruit of medium size, round-oblate; stem of medium length, slender; cavity small, closed; basin of medium size; skin yellow, covered with stripes and splashes of deep red; flesh yellow, very tender, juicy, aromatic, subacid; very good; September.

ROLFE. *Macomber.* Rolfe is a somewhat popular variety in cold regions because of superior hardiness, though it is above the average in both fruit- and tree-characters. The variety originated in the town of Guilford, Maine, about 1820, and is said to be a seedling of Blue Pearmain.

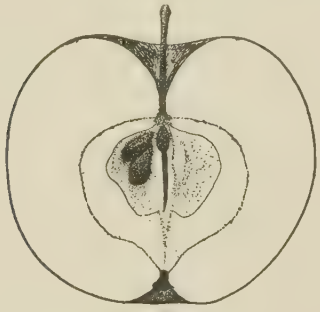
Tree large, vigorous, spreading and drooping, dense; laterals slender, willowy. Fruit sometimes large, uniform in shape and size, round or round-oblate, regular or angular, symmetrical; stem short to medium, slender; cavity acute, deep, wide, sometimes furrowed or compressed; calyx small, medium, closed; lobes short, wide, acute; basin large, regular, shallow, narrow, abrupt, wrinkled; skin thin, tough, glossy, pale yellow, sometimes blushed or in well-colored specimens shaded and striped with red; dots numerous, inconspicuous, small; prevailing effect yellow; calyx-tube narrow, short, funnel-shape; stamens median; core variable, medium to large, abaxile; cells usually symmetrical, wide open; core-lines clasping; carpels markedly concave, broadly ovate, emarginate, tufted; seeds large, long and narrow, plump, acute, light brown; flesh yellow, fine-grained, crisp, tender, juicy, brisk subacid; good; late September to January.

ROMAN STEM. *French Pippin.* This apple, described as early as 1817, is still more or less grown in the South, in the Mississippi Valley, and in the Pacific states. In the trying climate of the Great Plains, it is hardier than almost any other excepting Russian apples. The fruits are suitable for home use

only, lacking in size and in keeping qualities. The original tree was found near Burlington, New Jersey, where it still stood in 1817.

Tree moderately vigorous, spreading, irregular, very hardy and very productive; fruit small to medium, round, uniform; stem with a fleshy protuberance from the neighboring part, resembling a Roman nose, whence the name Roman Stem; skin rough, yellow, clouded and spotted; flesh tender, mild, juicy, with an agreeable flavor; good; early winter.

ROME BEAUTY. Fig. 49. *Rome.* Rome Beauty is a desirable commercial apple in all apple regions except northern ones, where in its early years at least, it is precariously hardy. The best characters are those of the tree. The trees, while of but medium size, are vigorous, come in bearing early, load with fruit annually, and in high winds the apples persist on the long stems and flexible branches better than those of almost any other variety. The trees are susceptible to blight and the scab-fungus—unfortunate faults. The apples are large, smooth, handsome, uniform in size and shape, thick-skinned, and, therefore, ship and keep well, but are of only mediocre quality. Gen-

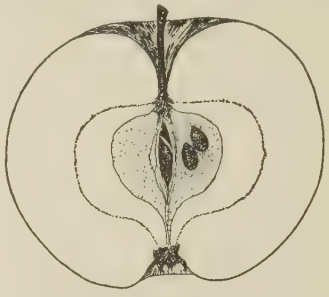


49. Rome Beauty. (×½)

erally speaking, Rome Beauty does best in southern latitudes or in the mild western climates, yet it is grown to perfection in some parts of New York and Michigan. It requires rich soils, failing in which, the fruits are undersized and poorly colored. Rome Beauty originated with H. N. Gillet, Lawrence County, Ohio, who brought it to the attention of fruit-growers in 1848.

Tree vigorous, small, at first upright but later spreading and drooping, with slender, lateral branches. Leaves long. Fruit medium to very large, uniform in size and shape, round, round-conic, or oblong, regular or faintly ribbed, usually symmetrical but sometimes with sides unequal; stem characteristically long, slender, often oblique; cavity large, characteristically obtuse and smooth, shallow, wide, sometimes compressed or lipped, often gently furrowed, green or red, never russeted; calyx small, closed or open; lobes converging above but separated toward the base; basin small, shallow, narrow, abrupt, usually furrowed or wrinkled; skin thick, tough, smooth, yellow mottled with bright red which in highly-colored specimens deepens to solid red on the exposed cheek, striped with bright carmine; dots numerous, white or brown, small; calyx-tube cone-shape, often with fleshy pistil point projecting into the base; stamens marginal; core medium to large, abaxile; cells sometimes unsymmetrical, open; core-lines meeting; carpels round, narrowing toward base and apex, sometimes obtusely emarginate, mucronate; seeds numerous, plump, acute, tufted, light and dark brown; flesh yellow, firm, fine-grained to coarse, crisp, juicy, aromatic, mild subacid; good; November to May.

ROXBURY RUSSET. Fig. 50. *Boston Russet. Rox. Roxbury. Russet.* Roxbury is the best known russet apple in America. The apples are notable keepers and before the days of cold storage were to be found under the



50. Roxbury Russet. (×½)

name "Russet," or "Rox," in all apple markets. With the coming of cold storage, the demand for the long-keeping, dull-colored russet apples has fallen off, and the popularity of Roxbury is now on the wane. The rough, tough-skinned, yellowish-brown, russeted fruits are known by all. The flesh, too, is distinct with its yellow-green color, its tenderness, and its pleasing sprightly flavor. The fruit is remarkable for the amount of sugar contained, making this about the best sort for cider. The variety does best in rich intervale soils, and is most popular in New England and westward into Michigan. Roxbury is supposed to have originated in Roxbury, Massachusetts, nearly 300 years ago, and is, therefore, one of the oldest American varieties.

Tree medium to large, vigorous, round-spreading. Fruit large, variable in size and shape, oblate or oblate-conic, often broadly and obscurely angular and sometimes remarkably elliptical, sides unequal; stem short, thick or swollen, pubescent, often red on one side; cavity acute, deep, wide, sometimes lipped; calyx large, pubescent, closed or partly open; lobes long, sometimes short, obtuse; basin variable, narrow, obtuse, furrowed and often wrinkled; skin tough, covered with yellowish-brown russet, colored specimens developing a bronze blush which rarely deepens to red; dots russet or gray; calyx-tube large, wide, with fleshy pistil point projecting into the base, conical; stamens basal; core axile; cells symmetrical, closed, rarely partly open; core-lines meeting; carpels flat, elongated and narrowing toward the apex, sometimes emarginate, mucronate, tufted; seeds few, often abortive, long, plump, acute, tufted; flesh yellow, firm, coarse, tender, breaking, juicy, sprightly subacid; good to very good; December to May.

ST. LAWRENCE. *Montreal.* St. Lawrence is an apple of the Fameuse type; the fruits greatly resemble those of Fameuse, but seldom equal them except in size, being usually much larger. It thrives in New England and parts of Canada and is especially prized along the St. Lawrence River. Its origin is not known, but it is probably a seedling of Fameuse grown in lower Canada early in the nineteenth century.

Tree of medium size, vigorous, upright-spreading. Fruit large, oblate-conic or round-oblate, faintly ribbed; stem short, slender; cavity large, acute, deep, regular, greenish-russeted; calyx small, closed; basin small, narrow, deep, abrupt, wrinkled; skin pale yellow washed and marbled with red, striped and splashed with dark carmine and overspread with thin bloom; dots numerous, obscure, fine, russet; calyx-tube narrow, cone-shape; stamens median; core medium in size, abaxile; cells partly open; core-lines clasping; carpels obovate, emarginate; flesh white, stained with red, tender, fine-grained, crisp, juicy, mild subacid; good to very good; September and October.

SALOME. Salome is a very good commercial apple in the southern Mississippi Valley. The characters commending the fruits are: ability to stand handling well, long-keeping qualities, and freedom from apple-scab. The outstanding characters of the tree are: hardiness, healthfulness, vigor, productiveness, early and nearly annual bearing. The variety needs a long season to develop either fruit or tree. Salome originated about 1853 in Ottawa, Illinois.

Tree vigorous, large, upright, dense. Fruit medium in size, uniform in size and shape, round-oblate to round-ovate, often elliptical, obscurely ribbed, usually symmetrical; stem long, slender; cavity large, acute, deep, broad, often compressed or obscurely furrowed, thinly russeted; calyx small, closed; basin often depressed, sometimes deep and inclined to abrupt, usually narrow, furrowed and wrinkled; skin thin, tough, smooth, pale yellow mottled and blushed with red and obscurely striped with carmine, marked toward the cavity with gray scarf-skin and covered with bloom; dots conspicuous, pale gray, often areolar with russet point; calyx-tube small, cone-shape; stamens basal; core large, abaxile; cells often unsymmetrical, usually wide open, sometimes closed; core-lines meeting; carpels thin, smooth, often concave, broadly round, sometimes emarginate; seeds numerous, wide, obtuse, light and dark brown; flesh yellow, firm, fine-grained, crisp, tender, juicy, sprightly subacid; good to very good; November to March.

SANDY GLASS. This Russian variety bears attractive greenish-yellow fruits, which, however, are of inferior quality and come at a season when there are many better apples. The trees are extremely hardy, and the variety, therefore, has value in cold regions. Sandy Glass was imported from Russia about 1880.

Tree small, vigorous, flat, spreading, drooping. Fruit large, uniform in size and shape, round-oblate or ovate, regular, sometimes obscurely ribbed; stem short, thick; cavity small, acuminate, deep, narrow, usually symmetrical, more or less russeted and often with outspreading rays of thin russet; calyx small, closed; lobes short, acute; basin shallow, wide, lightly furrowed, wrinkled; skin pale yellow, faintly blushed and overspread with bloom; dots numerous, small, submerged, with some large and russet; calyx-tube long, wide, conical; stamens median; core axile; cells symmetrical, closed or open; core-lines meeting; carpels ovate, deeply emarginate; seeds large, wide, plump, acute, dull dark brown; flesh white or with green tinge, fine, tender, juicy, brisk subacid; fair to good; September to early winter.

SCARLET PIPPIN. *Crimson Beauty. Crimson Pippin.* This is a Canadian apple of the Fameuse type; the fruits are somewhat similar to those of the well-known McIntosh, but differ in being firmer in flesh, more acid and not so good in quality. Scarlet Pippin originated about 1860 near Brockville, Ontario. Its culture is confined to Canada, New England, and nearby states.

Tree vigorous, upright. Fruit of medium size, round-oblate, regular; stem short, stout; cavity acute, shallow, wide, sometimes lipped; calyx closed or open; basin narrow, shallow, wrinkled; core small; flesh white, firm, crisp, tender, melting, juicy, mild subacid with a pleasant flavor; very good; fall and early winter.

SCOTT WINTER. *Scott's Red Winter. Scott.* This variety at one time played an important part as a commercial apple in New England, but seems now to be passing from cultivation. It came into prominence because of the hardiness, healthfulness, and reliability of the trees, and the long-keeping qualities of the apples. It is being superseded by better kinds, because the apples are small, uneven in shape and size, susceptible to scab, and with coarse flesh and austere flavor. The apple is now grown with profit only in a few parts of New England and Canada. It originated on the Scott farm, Newport, Vermont, about 1864.

SEEK-NO-FURTHER. See Westfield.

Tree large, vigorous, upright-spreading, dense. Fruit medium in size, round-conic or round-oblate, often irregularly elliptical, broadly ribbed; stem short or very short; cavity small, acuminate, deep, narrow, sometimes gently furrowed, usually russeted and often with outspreading russet rays; calyx small, closed; lobes converging, usually reflexed, narrow, acute; basin small, abrupt, usually deep, narrow, furrowed, often pubescent; skin smooth, thin, tough, pale yellow covered with red, mottled and striped with darker red; dots scattering, obscure, pale yellow or russet; calyx-tube long, cone-shape, sometimes extending into the core; stamens median; core small, axile or abaxile with hollow central cylinder; cells uniformly developed, symmetrical, closed or partly open; core-lines meeting; carpels broadly round, elliptical, emarginate, mucronate, smooth or nearly so; seeds numerous, small, narrow, acute, plump, dark, sometimes tufted; flesh yellow, sometimes stained with red, firm, crisp, coarse, tender, very juicy, briskly subacid, eventually becoming mild subacid, aromatic; good; November to April.

SHACKLEFORD. *Shackleford's Best.* Shackleford is an apple of the Ben Davis type. The fruits of several rivals in season of the same group surpass it in flavor, in keeping qualities, and in appearance. The trees have the merits of bearing young and regularly, and of being productive, hardy. Shackleford was discovered near Athens, Missouri, some time previous to 1883.

Tree medium in size, vigorous, flat, spreading, drooping, open. Fruit large, uniform in size and shape, round or round-ovate, regular and symmetrical; stem long, slender; cavity small, acuminate, shallow, narrow, symmetrical, russeted; calyx usually closed; lobes long, broad, acute; basin large, deep, wide, abrupt, wrinkled and furrowed; skin thick, tough, waxy, smooth, yellow washed with red, mottled and striped with carmine; dots inconspicuous, small, numerous, sometimes submerged, some imes russet; calyx-tube short, cone-shape, often with a fleshy pistil point projecting into the base; stamens median; core axile, small; cells symmetrical, closed or open; core-lines meeting; carpels pointed ovate, emarginate; seeds numerous, wide, plump, acute; flesh yellow, firm, coarse, crisp, tender, juicy, mild subacid; fair to good; November to April.

SHARP. Sharp is a little known variety, often confused with Maiden Blush, which it does not equal in tree or fruit. A comparison of the descriptions enables one at once to distinguish between the two. The variety can be traced to Halliday and Son, Baltimore, Maryland, about 1880. It is more generally grown in Illinois than elsewhere.

Tree small, upright, spreading, open; branches short, stout. Fruit of medium size, uniform in shape and size, round-oblate or round-conic, sometimes oblong-conic, regular or very faintly ribbed, symmetrical; stem short, not exserted; cavity large, acute, deep, wide, sometimes furrowed and often russeted; calyx small, closed or partly open; lobes long; basin shallow, deep, wide, abrupt, smooth or sometimes ridged or wrinkled; skin pale yellow with a bright blush; dots minute, pale or brown; calyx-tube funnel-form; stamens median to basal; core medium in size, abaxile; cells open or closed; core-lines clasping; carpels elliptical, emarginate; seeds large, long, flat, obtuse, dark; flesh white, firm, fine-grained, tender, crisp, juicy, mild subacid; very good; late September into October.

SHIAWASSEE. *Shiawassee Beauty.* This is another Fameuse seedling, and one well deserving general recognition, were it not that McIntosh and Fameuse excel it in tree and fruit. The apples have the merit of keeping well and of adding variety in size, color, and flavor to the winter supply of fruits. The variety originated in the orchard of Beebe Truesdell, Vernon, Michigan; it is little grown except in the state of its nativity. Its merits were first set forth in 1860.

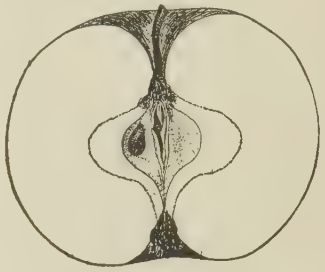
Tree of medium size, very hardy, vigorous, upright-spreading, healthy and long-lived. Fruit medium to large, uniform in shape but not in size, oblate-conic, regular or sometimes elliptical; stem medium in length, slender; cavity acute, deep, broad, symmetrical, sometimes compressed, often with outspreading russet rays; calyx small, closed; lobes short, narrow; basin shallow, wide, obtuse, somewhat furrowed and wrinkled, often compressed; skin pale yellow, overspread with red, irregularly splashed and striped with carmine; dots small, gray; calyx-tube wide, conical; stamens median; core small, widely abaxile; cells symmetrical, usually open; core-lines meeting; carpels cordate; flesh white, fine, crisp, tender, juicy, pleasant subacid, aromatic, sprightly; good to very good; October to January.

SHOCKLEY. *Sweet Romanite.* This is an old southern sort widely grown under several names. Before cold storage became common, Shockley was a favorite variety because of the long season of the fruits, which ripen in October and keep until the following summer. Its origin is not known, but it is reported as having been long grown in Maryland. Catalogs describe it as follows:

Tree erect, vigorous, coming into bearing early and very productive; fruit of medium size, round-conical, uniform in size and shape, yellow, with a bright crimson cheek; flesh firm, subacid or almost sweet, with a distinctive flavor; quality fair to good; October to May or June.

SMITH CIDER. *Cider. Pennsylvania Cider.* This is an old-time favorite in Pennsylvania, Ohio, and Indiana, usually failing in more northern regions, but now disappearing because of poor fruit-characters. Except in choice apple soils, the fruits do not attain sufficient size, attractive color, or high quality. The apples are not good enough for dessert, but give satisfaction for culinary purposes and, more particularly, for cider. The trees come in bearing young and are usually productive. The variety originated in Bucks County, Pennsylvania, and seems to have been first described in 1817.

Tree vigorous, tall, upright-spreading, open, with long, stout, straggling branches. Fruit medium to large, round-oblate, sometimes conic or oblong and truncate, regular, axis often oblique, sides sometimes unequal; stem short, slender; cavity large, acute, deep, narrow, often with outspreading russet rays; calyx open or sometimes closed; lobes leafy, long, acute; basin wide, very shallow and obtuse to deep and abrupt, somewhat furrowed and wrinkled; skin thin, smooth or roughened with capillary russet lines about the basin, glossy, pale yellow mottled and shaded with red, splashed and striped with carmine; dots white or russet, often areolar, conspicuous; prevailing effect bright red; calyx-tube short and obtusely cone-shape; stamens median; core large, abaxile or nearly axile; cells symmetrical, open or closed; core-lines meeting; carpels thin, smooth, broadly round or narrowing irregularly toward the apex, acuminate, emarginate; seeds numerous, wide, plump, obtuse, dark; flesh white, firm, fine-grained, crisp, tender, juicy, subacid becoming mild subacid, aromatic, sprightly; good; November to March.



51. Smokehouse. (×½)

SMOKEHOUSE. Fig. 51. *English Vandevere. Red Vandevere.* When the characters of Smokehouse are set forth, the variety seems almost perfect; yet it is nowhere very popular and it is being less and less planted. It is passing out, probably, because the apples lack high character in either flavor or appearance. The trees are vigorous, hardy, healthy, productive, come into bearing young, and hold their crop well. The variety originated on the farm of William Gibbons, Lancaster County, Pennsylvania, and was first brought to notice in 1848.

Tree medium to large, vigorous, wide-spreading, dense; lateral branches willowy, slender. Fruit medium to large, uniform in size and shape, round-oblate or oblate-conic, regular, symmetrical; stem medium to long, slender; cavity acute, deep, narrow, sometimes furrowed, often thinly russeted; calyx large, open; lobes often flat, convergent, separated at the base; basin shallow, wide, sometimes compressed, abrupt, wrinkled; skin thin, tough, smooth, or roughened with capillary russet lines and russet dots; color yellow mottled with dull red, sometimes deepening to a solid red, indistinctly mottled, striped and splashed with carmine; dots conspicuous, irregular, gray or russet, becoming smaller and more numerous about the basin; prevailing effect greenish-yellow, in highly-colored specimens red; calyx-tube wide, short, obtusely cone-shape; stamens median; core small, axile; cells symmetrical, closed or open; core-lines meeting; carpels flat, broadly elliptical to round or cordate, usually smooth; seeds few, very dark, large, narrow; flesh yellow, firm, fine, crisp, tender, juicy, mild subacid, delicately aromatic; good; October to March.

SNOW: See Fameuse.

SOPS OF WINE. *Bennington. Early Washington. Strawberry.* This is an old English dessert, culinary, and cider apple, known in Europe since 1688, when it was described by Ray, and grown in America for nearly two centuries. The crimson apples are handsome, well-

flavored, and have fine-grained flesh, which is white stained with red. It is grown only on the Atlantic seaboard and even there is rapidly passing from cultivation.

Tree large, vigorous, upright, dense. Fruit medium to large, uniform in shape but not in size, round or round-conic, ribbed, sides unequal; stem short, slender; cavity acute, deep, narrow, sometimes furrowed, with thin radiating russet rays; calyx small, closed or slightly open; lobes short; basin shallow, narrow, furrowed, wrinkled; skin thin, tender, roughened, greenish-yellow overspread with purplish-red, mottled, irregularly splashed and sometimes indistinctly striped with dark carmine, overspread with thin bloom; dots small, few, light russet or yellow; calyx-tube short, wide, cone-shape; stamens marginal; core of medium size, abaxile; cells usually symmetrical but not uniformly developed, open; core-lines meeting; carpels broad-ovate, concave, mucronate, tufted; seeds large, wide, plump, obtuse; flesh yellow often stained with pink, soft, fine, juicy, aromatic, mild, pleasant subacid; good; August to October.

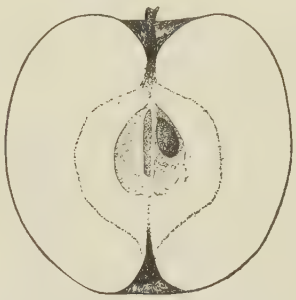
STARK. Stark surpasses most of its orchard associates in all essential tree-characters—the trees being vigorous, hardy, healthy, productive, and very accommodating as to soils. The fruits are large, smooth, well-turned in shape, uniform, and keep well, but are dull and unattractive in color and not good enough in quality for a dessert fruit, though well liked for culinary purposes and prime favorites for drying. The flesh is firm and the skin thick and tough, qualities which make the crop desirable for distant shipment. Stark is one of the most cosmopolitan of all apples, thriving wherever apples are generally grown on this continent. The variety probably originated in Ohio, having been described first in 1867 as coming from that state.

Tree vigorous, upright-spreading, dense, with long, strong branches. Fruit large, sometimes very large, uniform in size and shape, round-conic, oblate or round-ovate, sides sometimes unequal; stem short, stout; cavity acuminate, deep, wide, sometimes furrowed, occasionally lipped, sometimes russeted and with outspreading russet; calyx large, closed or partly open; basin shallow, obtuse, wide, wrinkled; skin smooth or roughened with russet dots, pale yellow more or less blushed and mottled with red and indistinctly striped with darker red; prevailing effect dull green and red, in highly-colored specimens bright red; calyx-tube wide, truncate cone-shape with fleshy pistil point projecting into the base; stamens median; core small, axile; cells uniform, symmetrical, closed or partly open; core-lines meeting; carpels thin, tender, flat, broadly round to obcordate, emarginate, mucronate, tufted; seeds few, long, acute, tufted; flesh yellow, firm, fine, breaking, tender, juicy, sprightly, mild subacid; fair to good; November to April.

STARR. The fruits of Starr are attractive green or yellow, early, and well-flavored—high enough in quality for dessert. The crop ripens at a season when competition is keen, and the variety has, therefore, scarcely gone further than its native state, New Jersey, where, according to Downing, it appeared in 1865.

Tree vigorous, upright-spreading, dense, with short, stout, curved branches. Fruit large, uniform in size and shape, oblate or round-oblate, regular or faintly ribbed; stem short, thick, sometimes swollen; cavity acute, shallow, broad, smooth or gently furrowed; calyx closed; lobes long, narrow; basin medium in depth, narrow, abrupt, furrowed; skin thick, tough, smooth, yellowish-green, sometimes with a faint blush; dots numerous, small and large, pale or russet; calyx-tube long, conical, large, extending to the core; stamens marginal; core large, abaxile; cells closed; core-lines clasping; carpels obovate, sometimes tufted; seeds dark brown, large, wide, plump, acute; flesh yellow, fine, tender, crisp, very juicy; good to very good; August and September.

STAYMAN. Fig. 52. *Stayman Winesap.* Stayman is a seedling of Winesap, which it much resembles in tree and fruit, but surpasses in several essentials; thus, the fruits are larger and better-flavored; the trees are more productive and adapted to a much wider



52. Stayman. (×½)

range of soil and climate. The apples fall short in brilliancy of color, a defect which lessens their popularity for the fancy-fruit trade. The culture of Stayman Winesap is limited to regions having a long season, for in northern latitudes the apples fail to attain perfection in size, color, or flavor. In the East, south of New York and Michigan, it is one of the most popular and valuable of all apples. The variety was grown from seed of Winesap planted in 1866 by Dr. J. Stayman, Leavenworth, Kansas.

Tree vigorous, spreading, open. Fruit medium to large, round-conic or globular, flattened at the base and rounding toward the basin, sides sometimes unequal; stem short; cavity large, acuminate, deep, often gently furrowed, sometimes compressed, russeted, sometimes with outspreading, broken, russet rays; calyx small, closed; lobes long, acute; basin small, sometimes oblique, shallow, narrow and obtuse to deep and abrupt, furrowed, wrinkled; skin smooth, thick, tough, yellow, often covered with dull red and indistinctly striped with carmine; dots light gray and russet, large; calyx-tube cone-shape, sometimes extending to the core; stamens median; core small, abaxile; cells symmetrical, closed or open; core-lines clasping the cylinder; carpels thin, tender, concave, elliptical, emarginate; seeds usually long, obtuse, plump, often abortive; flesh yellow, firm, fine-grained, tender, crisp, breaking, juicy, aromatic, sprightly, pleasant subacid; good to very good; December to May.

STREAKED PIPPIN. *Hempstead. Quaker. Red Pippin.* Streaked Pippin is characterized by the size and color of its fruit. The apples are large, sometimes very large, predominantly yellow, but always distinctly streaked with red. They rank from good to very good in quality either for dessert or for culinary purposes. The trees are satisfactory, excepting that they ripen their crop unevenly and do not hold it to maturity. The variety originated at Westbury, Long Island, and was first noticed in 1869.

Tree large, vigorous, upright-spreading, drooping, dense. Fruit large, uniform in size and shape, round-oblong or round-conic, often faintly ribbed, symmetrical;

stem short to medium, slender to thick; cavity acuminate, narrow, often furrowed, occasionally compressed, sometimes lipped, sometimes russeted; calyx small, closed or open; lobes short, obtuse; basin shallow, narrow, obtuse to wide and abrupt, often furrowed; skin thin, tough, smooth, covered with thin bloom which gives a dull effect, predominantly yellow, mottled and blushed with orange-red and distinctly striped with carmine; dots numerous and conspicuous, white or with russet point, often areolar; calyx-tube conical; stamens median; core large, abaxile; cells open or partly closed; core-lines clasping; carpels very concave, broadly roundish or approaching elliptical, mucronate, tufted; seeds medium to large, plump, acute, tufted; flesh yellow, firm, coarse, breaking, tender, juicy, pleasant subacid, aromatic; good to very good; November to February.

STUMP. Stump is so similar to the better-known Chenango in tree and fruit, having no qualities superior, that, though an excellent apple, it can never attain high rank in the lists of either home or commercial fruits. It originated on the grounds of John Prue, Chili, New York, and was first described in 1881.

Tree vigorous, upright; branches long, stout, curved. Fruit of medium size, uniform in size and shape, round-conic or oblong-conic, regular or faintly ribbed, sides sometimes unequal; stem very short, variable in thickness; cavity acute, shallow, broad, unsymmetrical, frequently furrowed, sometimes lipped, partly russeted; calyx small, open or closed; lobes short, narrow, acute; basin shallow, narrow, abrupt; skin smooth, pale yellow washed and mottled with pinkish-red, becoming deep red in highly-colored specimens, indistinctly striped and splashed with bright carmine; dots numerous, large, areolar with russet and white points; prevailing effect red and yellow; calyx-tube broadly conical with fleshy pistil point projecting into the base; stamens basal; core large, usually abaxile; cells open; core-lines meeting; carpels elongated-ovate tapering toward base and apex; seeds dark brown, small, very wide, short, plump, obtuse; flesh white tinged with yellow, fine, tender, juicy, rich, aromatic, sprightly, pleasant subacid; very good; September and October.

SUMMER QUEEN. *Sweet Harvest. Queen.* Summer Queen is an old variety, at one time rather largely grown in eastern United States, but now seldom planted except in the Pacific states, where it is still offered by several nurserymen. It is of value only for home use and local markets; the fruits ripen over a long season and do not ship or keep well. The variety seems to have been first described in 1806.

Tree lacking in vigor, rather small, spreading, productive, bearing annually. Fruit medium to large, round-conic, somewhat angular; stem medium to long, slender; cavity narrow to wide, regular, deep; calyx large, open, or closed; basin shallow or none, furrowed; skin yellow, striped, splashed and shaded with mixed red; dots small, yellow; core medium in size with cells open; seeds numerous, acute, brown; flesh whitish-yellow, sometimes with a tinge of pink, firm, aromatic, juicy, subacid; quality good to very good for culinary purposes; August and September.

SUMMER RAMBO. *Rambour. Summer Rambour.* This apple is of the type of the better-known Grosh, differing chiefly in ripening its crop about a month earlier. The variety probably originated in France more than two centuries ago, and has been grown in America since 1800. It is now to be found, on this side of the Atlantic, only in Ohio and states to the West.

Tree vigorous, upright-spreading, open. Fruit large or very large, uniform in size and shape, oblate or round-oblate, sometimes ovate, faintly ribbed, regular, sides often unequal; stem short, thick; cavity acuminate, deep, broad, usually symmetrical, sometimes lipped, sometimes russeted near the stem; calyx large, closed or sometimes open; lobes short, narrow, acute; basin deep, wide, abrupt, smooth, symmetrical; skin thick, tough, smooth, yellow or greenish, in well-colored specimens largely washed and mottled with red, conspicuously marked with many broken stripes and splashes of carmine; dots numerous, usually small and submerged, with some large, brown or russet; prevailing effect striped; calyx-tube medium in length, wide, broadly conical; stamens median; core small, axile; cells closed; core-lines meeting; carpels round-ovate; seeds frequently abortive, or large, wide, plump, acute, dark brown; flesh yellow, firm, breaking, coarse, tender, very juicy, mild subacid, somewhat aromatic; good; September to November.

SUTTON. *Morris Red. Sutton Beauty.* Few apples are more attractive in appearance or better in taste than those of Sutton. In consequence, the variety has been much sought after, but plantations of it have usually proved a failure because of weaknesses in the trees. The trees are very capricious as to soils, bear spasmodically,—even individuals show irregularities in bearing, often a branch producing while the rest of the tree is barren; and, worse than any other fault, Sutton takes longest of all varieties to come into fruiting. The variety has gone through its probationary period and by common consent is a failure as a commercial apple, but the uniform size, symmetrical shape, and delectable quality of the fruit make it a most desirable sort for the home orchard and fancy-fruit market. The name commemorates the town of Sutton, Massachusetts, in which the variety originated some time previous to 1849. Sutton is chiefly grown in New York and New England.

Tree vigorous, upright, dense, with stout branches. Leaves narrow, dark green. Fruit rarely large, uniform in size and shape, round or oblong, rounding toward cavity and basin, symmetrical, regular or very slightly ribbed; stem short, sometimes fleshy; cavity acute, wide, symmetrical, often with greenish-russet; calyx partly open, sometimes closed, pubescent; lobes long, acuminate; basin shallow and obtuse to deep and abrupt, furrowed and wrinkled, sometimes compressed; skin thin, tough, often roughened toward the basin by concentric russet lines and fine russet dots, otherwise glossy and smooth, bright red striped with carmine; prevailing effect red; calyx-tube symmetrical, conical; stamens median; core small, abaxile; cells symmetrical, closed; core-lines clasping; carpels broadly cordate, emarginate, sometimes tufted; seeds light brown, small, plump, acute, sometimes tufted; flesh yellow, firm, fine-grained, crisp, tender, juicy, mild subacid; good to very good; November to March.

SWAAR. Swaar is distinguished by greenish-yellow fruits, covered with dots and flecks of russet, which have heavy, aromatic flesh of uncommonly rich flavor. The apples keep well both in ordinary and cold storage. Though the apples are comparatively unattractive, the faults of the variety are chiefly those of the trees, which are neither long-lived nor hardy; suffer much from apple-canker; lack vigor; are shy bearers; and lose a large part of the crop as drops or culls. Swaar was early produced by the Dutch settlers in the Hudson River Valley, and has long been a favorite in that region.

Tree of medium size, vigorous, round to spreading, dense; branches inclined to droop. Fruit medium to large, uniform in size and shape, round-oblate, often ribbed, regular, symmetrical; stem medium in length,

slender; cavity large, acute, deep, wide, often furrowed, usually russeted and with broken outspreading russet; calyx small, closed or open; lobes broad, obtuse, usually connivent; basin small, shallow, obtuse, wide, furrowed and wrinkled; skin tough, roughened with dots and flecks of russet, yellow, often shaded with a bronze blush; dots numerous, green or russet; prevailing effect yellow; calyx-tube cone-shape; stamens median; core small, axile, with hollow cylinder in the axis; cells symmetrical, closed or partly open; core-lines clasping; carpels thin, tender, broadly round, emarginate, mucronate, sometimes tufted; seeds numerous, broad, plump, obtuse, light brown; flesh yellow, firm, tender, fine-grained, juicy, mild or very mild subacid, aromatic, rich; very good to best; November to April.

SWAZIE. *Golden Gray.* Swazie is very similar in fruit and tree to Pomme Grise. The fruits, however, in most respects are an improvement. Thus, the golden russet color makes them more attractive; they are, too, more aromatic; a little more richly flavored; of slightly larger size; and further distinguished by being more oblong. Unfortunately the trees are not productive and but fairly vigorous, though very hardy. The variety originated on the Swazie farm, Niagara, Canada, and was first described by Downing in 1872. Swazie is a comparatively rare variety except in Ontario and Quebec.

Tree vigorous, upright. Fruit small, oblate, conical or round; stem short, slender; cavity narrow, acute, deep; calyx closed or partly open; lobes broad, obtuse; basin narrow, medium in depth, furrowed gently, wrinkled; skin pale yellow with some cinnamon-russet; dots numerous, white; calyx-tube elongated, cone-shape; stamens median; core small, abaxile, often with hollow cylinder in the axis; cells symmetrical, closed or open; core-lines meeting; carpels broadly round, truncate at the base, narrowing toward the apex, mucronate; seeds numerous, small, narrow to broad, often angular, usually obtuse; flesh pale yellow, fine-grained, tender, crisp, juicy, highly aromatic, sprightly, mild subacid, pleasant; very good to best; December to March.

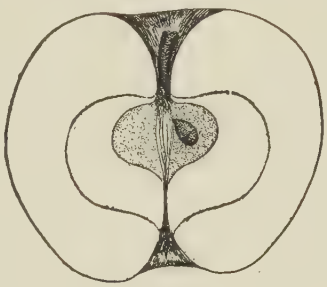
SWEET BOUGH. Fig. 53. *August Sweet. Autumn Bough. Bough. Early Bough. Yellow Bough.* Sweet Bough is acknowledged by all to be the best summer sweet apple. The tender flesh and honied sweetness of the fruits

53. Sweet Bough. (×½)

as eaten from the hand remain in whatever way the apple may be prepared for the table. The fruits are large and handsome, and the trees are all that could be desired, falling short only in hardiness. The apples are too tender for distant shipment, but they are ideal for home use or local market. Sweet Bough is an old variety of American origin, described first in 1817, and now well distributed throughout the United States.

Tree vigorous, upright-spreading, dense. Fruit medium to large, uniform in size and shape, round-conic or ovate, sometimes oblong-conic with broad and flat base, regular, sides often unequal; stem short, thick, usually not exserted; cavity acuminate, deep, broad, sometimes furrowed, usually smooth; calyx small, closed or partly open; lobes often leafy, sometimes separated at the base, long, narrow, acute; basin small, shallow, narrow, abrupt, smooth or wrinkled; skin thick, tough, smooth, pale yellow, sometimes faintly blushed; dots numerous, small, light-colored and submerged, sometimes russet; calyx-tube long, wide at top, conical; stamens median; core large, abaxile; cells closed or open; core-lines clasping; carpels round or cordate, emarginate, tufted; seeds light brown, small, plump, acute; flesh white, firm, fine, crisp, very tender, juicy, sweet, aromatic; good to very good; August and early September.

SWEET WINESAP. Fig. 54. *Hendrick. Hendrick Sweet. Sweet Pearmain.* Under one or another of its several names, Sweet Winesap is cultivated as widely as any other sweet apple,



54. Sweet Winesap. (×½)

excepting Tolman and Pound Sweet. The fruits are a handsome red, large, well-turned, symmetrical, and uniform; excellent for dessert or culinary uses; and sufficiently firm of flesh and tough of skin to stand marketing and storage. The trees are a little lacking in vigor and hardiness, but are usually healthy, long-lived, and productive, though they are somewhat tardy in coming in bearing. It is not known where the variety originated, but it seems to have been described first in 1854. Though widely distributed, Sweet Winesap is most commonly grown in New York and Pennsylvania.

Tree medium in size, vigorous, upright-spreading, dense. Fruit medium to large, uniform in size and shape, round-conic, wide and flattened at the base, round-ovate or oblate-conic, regular or elliptical, symmetrical; stem short, slender; cavity acuminate, shallow, wide, symmetrical or gently furrowed, sometimes partly russeted; calyx open; lobes long, acuminate; basin large, often oblique, round, deep, wide, abrupt, sometimes furrowed; skin tough, smooth, pale yellow overspread with bright red, plainly marked with long, narrow carmine stripes, covered with a thin bloom and often with thin, light gray scarf-skin producing a dull effect; dots small, scattering, white or russet; prevailing effect red or striped-red; calyx-tube funnel-shape with broad, yellow limb and narrow cylinder; stamens median; core small, axile or sometimes abaxile; cells symmetrical, closed or partly open; core-lines clasping; carpels flat, round to broadly elliptical, emarginate; seeds small, plump, obtuse; flesh white, firm, fine, crisp, tender, juicy, sweet; good to very good; November to March.

TERRY. *Terry Winter.* Terry is very generally recommended for the cotton-belt of the South, usually with the advice that it be more largely planted. It is, however, an old sort that seems to be losing in popularity. The qualities that particularly recommend it for the South are that the crop ripens late and keeps well. Terry is said to have originated in Georgia a good many years ago, but when or where does not appear; neither are there full descriptions of the variety. Catalogs describe the fruits as of medium size, pale yellow overspread with rich red and russet; the quality is said to be good; the season is from November until March.

TETOFSKY. Tetofsky is the standard early apple in the northern limits of apple culture. It has, too, some value in more southerly regions, the fruits being attractive in color and pleasantly acidulous in flavor. The apples are small, however, and fall short, when all characters are considered, of several other summer apples in the great fruit regions. Tetofsky is a pioneer Russian variety, having been imported in 1835 by the Massachusetts Horticultural Society.

Tree dwarfish, vigorous, very erect, dense, with stout branches, filled with small spurs. Fruit small, uniform in size and shape, oblate or round, sometimes conic, regular; stem medium in length, slender; cavity obtuse, medium to deep, broad, usually symmetrical, gently furrowed; calyx large, closed; lobes long, broad; basin shallow, furrowed and wrinkled; skin thick, tough, smooth, waxy, greenish-yellow, more or less striped and splashed with bright red, overspread with faint bloom; dots inconspicuous, pale, submerged; calyx-tube long, wide, funnel-shape; stamens median; core large, axile or somewhat abaxile; cells open; core-lines clasping; carpels broadly round, concave; seeds short, plump; flesh white, firm, coarse, tender, juicy, sprightly, aromatic, subacid; fair to good; late July to early September.

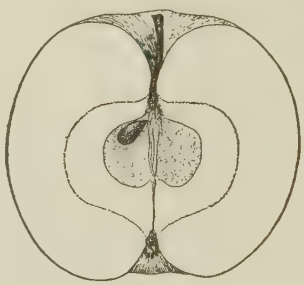
TITOVKA. *Titus Apple. Titus Riga.* Titovka is valuable in the upper Mississippi Valley, and has considerable merit in all regions where hardiness must be taken into account. The apples, which are large and handsome, are suitable for culinary use, but scarcely so for dessert. The trees, besides being hardy, are vigorous, healthy, and productive. The variety was imported from Russia in 1870 by the United States Department of Agriculture.

Tree dwarfish but vigorous, upright, dense, with stout, twiggy branches. Fruit large, round or oblong, sometimes conic, regular, symmetrical; stem short, usually not exserted; cavity acuminate, very deep, sometimes russeted; calyx of medium size, closed; segments small, convergent; basin shallow, very abrupt, wrinkled; skin smooth, yellow, shaded and striped with bright red and overspread with light bloom; calyx-tube elongated-cone-shape; stamens median; core large, abaxile; cells symmetrical, open; core-lines clasping; carpels broadly round or obovate, emarginate; seeds few, small, plump; flesh white, coarse, crisp, juicy, subacid; good to very good; August and September.

TITUS PIPPIN. *Hang-on. Timothy. Well Apple.* Every character of Titus Pippin bespeaks its relationship to Yellow Bellflower, by which it is surpassed in both tree and fruit. The fruits are large, smooth, attractive, pleasantly flavored, and adapted to either dessert or culinary uses. The trees are vigorous, hardy, healthy, productive, long-lived, bear young, and hold their load well. Despite these good qualities, the variety, after a long period of probation, is not superseding the better-known Yellow Bellflower. Titus Pippin originated near Hempstead, Long Island, and was first described in 1841. It is still a general favorite on Long Island, but is little known elsewhere.

Tree large, vigorous, upright-spreading, dense. Fruit large, oblong-conic or round-conic, often irregularly elliptical or obtusely ribbed, sides unequal, axis oblique; stem medium in length and thickness; cavity small, acuminate, deep, narrow to broad, furrowed, often russeted and with narrow, outspreading russet rays; calyx large, open; lobes leafy, long, acute; basin small, often oblique, shallow to deep, narrow, abrupt, often prominently ribbed, sometimes with mammiform protuberances; skin tender, smooth, waxy, yellow, clouded with green, sometimes with an orange blush, rarely with distinct red lines or dots; dots numerous, small, russet or submerged; prevailing effect yellow; calyx-tube large, wide, deep, cone-shape with fleshy pistil point projecting into the base; stamens median; core large, abaxile; cells symmetrical, wide open, sometimes partly closed; core-lines clasping or meeting; carpels elongated-ovate, emarginate, tufted; seeds irregular, often imperfectly developed, large, long, acute; flesh yellow, firm, coarse, crisp, tender, juicy, subacid, with pleasant aroma; good to very good; October to February.

TOLMAN SWEET. Fig. 55. *Tallman Sweet. Tolman.* Tolman Sweet is the leading sweet apple of this continent. It has attained and holds this high place by virtue of good characters of both fruit and tree. The fruit-characters which commend it are attractive appearance, fair size, and good quality. The fruits are everywhere liked for dessert, but are even more highly esteemed for all culinary purposes. The variety is easily distinguished by



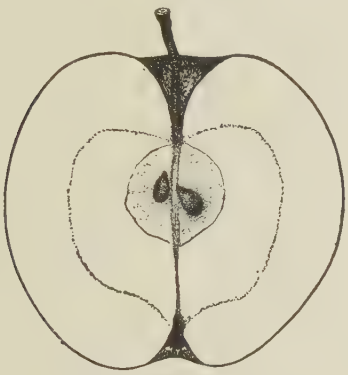
55. Tolman Sweet. (×½)

a suture line which runs from the cavity to the basin. The trees are preëminent among those of all apples—hardy, healthy, vigorous, productive, long-lived, hold the crop well, and come into bearing early. The many good characters of the trees make Tolman a favorite as a stock upon which to top-work kinds less well endowed. The origin of this best of all sweet apples is unknown. It was brought to the attention of fruit-growers in 1822. Tolman is grown in all the leading apple regions of America.

Tree vigorous, upright-spreading, drooping, open; branches long, stout, curved and drooping. Fruit medium to large, uniform in size and shape, globular or round-conical, often elliptical or obscurely ribbed; stem medium to long, slender; cavity obtuse, broad, deep,

often russeted, obscurely furrowed; calyx small, open or closed; lobes long and acuminate; basin small, often oblique, shallow, abrupt, furrowed, wrinkled, sometimes compressed; skin tough, marked by a suture line extending from the cavity to the basin; color pale yellow, sometimes blushed; dots inconspicuous; capillary russet lines over the surface, becoming heavier and concentric at the basin; calyx-tube urn-shape; stamens basal; core small, axile; cells symmetrical, closed; core-lines clasping; carpels flat, broadly round, emarginate, tufted; seeds wide, plump, acute, tufted; flesh white, firm, fine, dry, sweet; good to very good; October to March.

TOMPKINS KING. Fig. 56. *King. Winter King.* Tompkins King, commonly shortened to King, has few superiors on the score either of beauty or quality of fruit; accordingly,



56. Tompkins King. (×½)

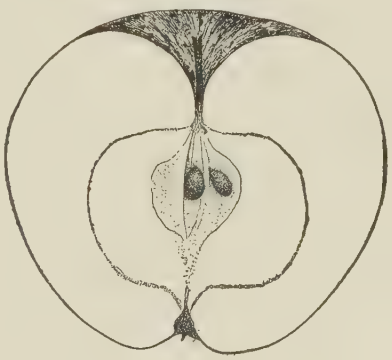
it is one of the most widely planted apples in home orchards, and in either home or foreign market sells for a higher average than most other standard apples. The fruits are a beautiful red on a yellow background, handsomely moulded, uniformly large and symmetrical; while the flesh is rather coarse, it is crisp, tender, juicy, aromatic, and richly flavored. In common storage, King keeps until January, and in cold storage two or three months later. While the fruit is paramount, the trees are far from being so; they lack in hardiness, healthiness, longevity, and productiveness, so that few varieties are harder to handle. King thrives only in fertile, well-drained soils, and, since at best there are many windfalls, it must be sheltered from strong winds. Codlin-moth takes heavy toll, but there is comparatively little injury from apple-scab, though the trees suffer much from apple-canker, sun-scald, and collar-rot. Many recommend working King on a more vigorous stock. The variety originated in Warren County, New Jersey, whence, about 1804, it was brought to Tompkins County, New York, and given its present name. It is widely distributed throughout the North and East, but is most commonly grown in New York, where it ranks fourth in commercial importance.

Tree vigorous, spreading, open; lateral branches slender and drooping. Fruit large to very large, uniform in shape and size, round or oblate, sometimes conic, regular or obscurely ribbed; stem short to long, sometimes thick and swollen; cavity large, obtuse, deep, narrow, furrowed or wavy, occasionally lipped, often russeted, sometimes with fine outspreading russet; calyx large, closed or open; segments long, acuminate; basin small, narrow, shallow, deep, abrupt, regular or obscurely ridged and wrinkled; skin smooth or roughened with russet dots, yellow, mottled and washed with orange-red, often shading to deep red, striped and splashed with bright carmine; dots numerous, conspicuous, white or russet; prevailing effect red over yellow; calyx-tube small, cone-shape; stamens median; core large, abaxile; cells symmetrical, closed or partly open; core-lines meeting; carpels ovate or obovate, tufted, mucronate, slightly emarginate if at all; seeds few, large, long, irregular, obtuse, often abortive, tufted; flesh yellow, coarse, crisp, tender, aromatic, juicy, subacid; very good to best; October to April.

TUFTS. *Tufts Baldwin. Tufts Seedling.* This apple is of the Baldwin type; the fruits are very similar in form, color, and size, but differ somewhat in flavor, being much milder. It is not so good a variety as Baldwin, but is occasionally preferred, especially in New England, where it is chiefly to be found. It originated at Cambridge, Massachusetts, about 1830.

Tree large, vigorous, spreading, flat, open. Fruit large, uniform in size and shape, round or round-oblate, sometimes with a broad protuberance above the cavity on one side, often flattened at apex, broadly ribbed; stem long, slender; cavity acute, medium in depth, broad, often furrowed, usually with outspreading, irregular, greenish-russet rays; calyx small, usually closed; basin shallow, wide, obtuse, wrinkled, ridged; skin thin, tough, smooth, green or yellow nearly covered with bright, deep red, with indistinct stripes of purplish-carmine; dots inconspicuous, gray or russet; calyx-tube medium in length, conical; stamens median; core large, axile; cells closed or partly open; core-lines clasping; carpels broadly round, often discolored, flat, emarginate; seeds few, not well developed, dark brown, large, long, somewhat acute, tufted; flesh yellow or greenish, firm, coarse, crisp, tender, juicy, mild subacid; fair to good; October to December or January.

TWENTY OUNCE. Fig. 57. *Cayuga Red Streak. Twenty Ounce Pippin.* Twenty Ounce is the standard fall apple for the market in New England and the North Atlantic states, its culture extending as far south as Maryland. It continues to hold its place against all competition by virtue of many excellences in



57. Twenty Ounce. (×½)

fruit and tree. Thus, the apples are large, handsomely colored with stripes and splashes of red on a rich yellow background, and while the quality is not good enough for a dessert apple, the fruits are scarcely surpassed for culinary uses. Furthermore, the apples are uniform in size, color, and shape, and stand handling rather better than any other fall

variety. The trees bear early and abundantly, hold their crop well, but fall short in being susceptible to winter-injury and canker-fungi and in not attaining large size. Twenty Ounce was brought prominently to notice by Downing in 1845, but the origin of the variety remains a mystery.

Tree vigorous, upright becoming round-topped, dense, with branches long and stout; laterals willowy, slender, drooping. Fruit very large, round or round-conic, sometimes broadly ribbed; stem deep set, short, thick or slender; cavity acuminate, very deep, sometimes lipped, sometimes russeted; calyx usually closed; basin often oblique, shallow but occasionally deep, narrow, abrupt, broadly and deeply furrowed; skin thick, tough, green becoming yellow, washed, mottled and splashed with bright red or deepening to dark or purplish-red, with carmine stripes; dots gray or russet, small, often raised, sometimes submerged; calyx-tube large, long, wide, conical, extending to the core; stamens usually basal; core large, axile or abaxile; cells symmetrical, usually closed, sometimes wide open; core-lines clasping the cylinder; carpels elongated-ovate, emarginate, tufted; seeds narrow, obtuse, variable; flesh yellow, coarse, tender, juicy, subacid; good; late September to early winter.

TWENTY OUNCE PIPPIN. *Cabashea. King. Oxheart.* Twenty Ounce Pippin subsists only because it has been much planted for Twenty Ounce, a very different and much better apple. The apple of this description is very large and rather attractive in appearance, but is coarse in flesh and poor in quality. The trees are satisfactory except in productiveness. The origin of the variety is not known, but it is an old sort long cultivated before Downing published the first account of it in 1845. It is grown chiefly in New York and neighboring states.

Tree medium to large, vigorous, spreading or somewhat drooping. Fruit large or very large, heavy, oblate or globular with flattened base, often conic, elliptical or obscurely ribbed, sides frequently unequal; stem short, thick; cavity acute, shallow, wide, furrowed, sometimes lipped, green, with elongated white dots, often russeted and with outspreading russet rays; calyx large, closed or partly open; lobes separated at the base, wide, flat or reflexed, pubescent; basin large, shallow, obtuse, irregularly furrowed and wrinkled; skin thick, tough, smooth, pale yellow, washed, mottled and blushed with red, striped and splashed with carmine; dots numerous, small, narrow, elongated, conspicuous, often submerged or depressed, white, sometimes with russet point; calyx-tube short, funnel-shape with wide limb, or obtuse cone-shape; stamens median; core large, axile; cells usually symmetrical and closed, sometimes open; core-lines clasping the funnel cylinder; carpels broadly round or ovate, emarginate, tufted, brown; flesh yellow, firm, coarse, tender, crisp or breaking, juicy, sprightly subacid with a peculiar flavor; fair or good in quality; October to February.

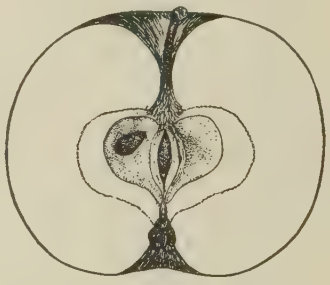
UTTER. *Seever's Red Streak. Utter's Red.* Utter has value in Wisconsin, where it has been known since 1855, because of its hardiness. The description which follows contains but little to indicate that it is of general value in apple-culture.

Tree upright, healthy, vigorous, productive, with a full-rounded head, very hardy. Fruit large, round-oblate or round, sometimes oblong, often broadly ribbed, regular; stem short, stout; cavity acute, deep, wide, furrowed, sometimes russeted; calyx small, closed; lobes small, short, obtuse; basin shallow, medium in width, abrupt, furrowed and wrinkled; skin thick, tough, pale yellow usually washed with orange-red and narrowly streaked with bright carmine; dots inconspicuous, numerous, white, occasionally with russet point; calyx-tube elongated-funnel-form; stamens median; core sessile, of medium size, abaxile; cells symmetrical, open or closed; core-lines clasping; carpels broadly round, but slightly emarginate if at all, smooth or tufted; seeds numerous, large, narrow, obtuse, light reddish-brown; flesh yellow, coarse, crisp, tender, juicy, mild subacid, pleasant flavored; good; October to December or later.

VANHOY. *No-core.* The apples of this variety, as grown in the North at least, have little to commend them except that the core is small and the seeds are small and few if any. The description which follows, made from northern grown trees, may not do the apple justice, for, in North Carolina, where it is said to have originated soon after the Civil War, Vanhoy is said to be a good dessert apple and in demand in the markets.

Tree vigorous, spreading, flat, open. Fruit medium to large, oblate or round, sometimes conic, axis sometimes oblique, sides often unequal; stem medium to long, thick; cavity acute, narrow, deep, often compressed or obscurely furrowed, sometimes lipped, sometimes thinly russeted; calyx large, closed or partly open; lobes often leafy, long, acute; basin small, obtuse, medium in width and depth, occasionally furrowed; skin thick, leathery, smooth, yellowish-green overspread with dull red and marked with narrow, obscure splashes of carmine; dots conspicuous, pale yellow or russet; calyx-tube large, cone-shape; stamens median; core small, abaxile; cells symmetrical, closed; core-lines meeting or, when the tube is cone-shape, clasping; carpels flat, round-ovate, emarginate, mucronate; seeds few, wide, long, obtuse, sometimes tufted, often all are abortive; flesh yellow, firm, coarse, crisp, breaking, juicy, mild subacid; fair quality; January to May.

VICTORIA SWEET. Fig. 58. *Victoria.* Victoria is one of the good red sweet apples. The fruits are easily identified by their dark red color and large, conspicuous dots, which call to mind varieties in the Blue Pearmain



58. Victoria Sweet. (×½)

group. In quality, while a little coarse, the apples are good to very good for either culinary uses or dessert. Victoria is now grown only in New York, in which state it came to notice about 1840.

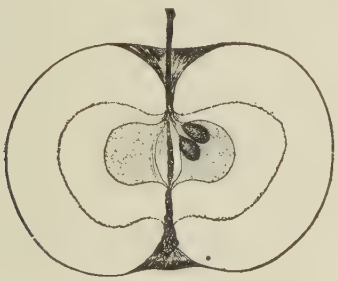
Tree vigorous, spreading, with short, stocky, crooked branches. Fruit of medium size, uniform in size and shape, round-conic, flattened at the base, faintly and broadly ribbed; stem usually short, thick; cavity deep, broad, symmetrical, often lipped, sometimes red and smooth, yellow-russet often overspreading the cavity and radiating irregularly over the base in broken lines and splashes; calyx small, closed or partly open; lobes usually short and not separated at base, acute; basin medium in depth, narrow, abrupt, wrinkled; skin tough, smooth, yellow, blushed and mottled with dull red and marked with numerous, narrow stripes of deeper red; dots or flecks conspicuous, gray or russet, becoming smaller and more numerous toward the cavity; calyx-tube short, conical; stamens median; core medium in

PLATE III.—SECKEL PEAR.

size, abaxile; cells closed or partly open; core-lines clasping the cylinder; carpels round-cordate, concave, tufted; seeds numerous, dark, flat, acute; flesh yellow, firm, coarse, very tender, juicy, sweet; good to very good; October to January.

VIRGINIA BEAUTY. Virginia Beauty is offered by several nurserymen from Virginia and North Carolina, the variety being popular in southwest Virginia and the neighboring parts of North Carolina. The fruit-character of especial merit is that of long-keeping, although the apples are attractive in appearance and of very good quality. Nurserymen describe the trees as being large, vigorous, healthy, and very productive. The apples are described as large, conical, red, with yellow flesh which is rich and aromatic. The variety is said to have been grown for over fifty years and is still highly prized. The season is from late fall to April.

WAGENER. Fig. 59. Wagener is most remarkable for precociousness in bearing, which makes it a general favorite for planting as a filler between permanent trees. Its merits and its faults are chiefly those of the tree. To name the merits first: besides coming in



59. Wagener. (×½)

bearing early, the trees bear annually and heavily and are hardy. The several faults are that the trees overload, are short-lived, subject to blight, and, vigorous at first, become very weak in growth with advancing age. The apples are attractive in appearance because of their bright red color. The quality is much above the average either for dessert or cookery —some rank it excellent. Wagener came from seed planted in 1791, near Penn Yan, New York. It has been widely planted in all northern apple regions.

Tree dwarf, at first vigorous but soon dwarfing, round to spreading, open; branches short, stout and filled with spurs. Fruit medium to large, oblate or round-oblate, broadly ribbed or irregularly elliptical, sides often unequal; stem short to long, slender; cavity variable, acute, deep, broad or sometimes compressed and narrow, often angular or furrowed, thinly russeted; calyx small, closed or partly open; lobes small, short, acute, connivent, reflexed; basin medium in width and depth, abrupt, furrowed; skin thin, tough, smooth, glossy, bright red striped with carmine and mottled and streaked with thin scarf-skin over a clear, pale yellow background; dots numerous, white or russet, sometimes mingled with light russet flecks; prevailing color bright red; calyx-tube long, narrow, funnel-form, often elongated and extending to the core; stamens median; core large, abaxile with hollow cylinder in the axis, or nearly axile; cells symmetrical, closed or open; core-lines clasping the cylinder; carpels broadly round or elliptical, but slightly emarginate if at all, smooth, mucronate; seeds numerous, small, short, wide, obtuse, light brown, often abortive; flesh firm, fine-grained, crisp, tender, very juicy, subacid, aromatic, sprightly; very good to best; October to February.

WALBRIDGE. *Edgar. Red Streak. Kentucky Red Streak.* Several good characters have enabled Walbridge to gain a foothold in the states of the North Mississippi Valley. Its merits are chiefly in the trees, which are hardy, healthy, vigorous, come into bearing young, and yield full crops biennially. Some of the popularity of Walbridge is due to its very satisfactory growth in the nursery, because of which it is a favorite with nurserymen. The apples, while not remarkable in appearance, are attractive when well grown, but often much of the crop is undersized and malformed. It is a culinary fruit which keeps in ordinary storage until February. The variety originated with Joseph Curtis, Paris, Illinois, in 1818.

Tree medium in size, vigorous, upright-spreading, open. Fruit medium in size, round-conic, flattened at the base, or round to oblate-conic, often one-sided; stem short; cavity acute, deep, narrow, symmetrical, furrowed gently, sometimes partly covered with fine russet; calyx small, usually closed, pubescent; basin small, shallow or scarcely depressed, often oblique, furrowed and wrinkled; skin thin, tough, smooth, pale yellow washed with red, conspicuously mottled and striped with carmine and overspread with thin bloom; dots numerous, often submerged, conspicuous, white or a few russet; prevailing effect striped-red; calyx-tube long, narrow, cone-shape with fleshy pistil point projecting into base; stamens median; core small, abaxile, with a wide, hollow cylinder in the axis, sometimes axile; cells symmetrical, closed or partly open; core-lines clasping; carpels broadly round, emarginate, mucronate; seeds few, tinged with yellow, firm, fine to coarse, crisp, tender, juicy, sprightly, mild subacid, aromatic; fair to good; November to February.

WASHINGTON ROYAL. *Palmer Greening.* Under the name here given and also that of Palmer Greening, this variety is held in high regard in parts of New England. It seems to have few outstanding characters of either tree or fruit to recommend it. The apples are of very good flavor, which, however, is too mild for most tastes. Numerous and conspicuous areolar dots with russet centers on a waxy, yellow skin, sometimes blushed, are characteristics of the fruit. The variety originated in Sterling, Massachusetts, and was brought to notice in 1855.

Tree vigorous, upright-spreading. Fruit medium to large, oblate, often ribbed, irregular; stem short; cavity medium to large, acuminate, narrow, often furrowed, usually smooth and green; calyx small, partly open, sometimes closed; lobes erect; basin shallow, narrow, abrupt, often furrowed, wrinkled; skin thin, tender, waxy, greenish-yellow, usually with thin dull orange blush which sometimes deepens to red; dots numerous, white or areolar with russet center, characteristic and conspicuous; prevailing effect greenish-yellow; calyx-tube conical; stamens median; core large, abaxile; cells closed or partly open; core-lines clasping the funnel cylinder; carpels concave, broadly round, emarginate; seeds dark, wide, plump, obtuse; flesh white, firm, fine, crisp, tender, juicy, pleasant subacid, aromatic; good to very good; November to April.

WASHINGTON STRAWBERRY. *Juniata.* At its best, Washington Strawberry is a fine dessert and culinary apple. Unfortunately, the fruits are extremely variable in

size, color, and quality as grown in different localities—a fatal fault for a market apple and a serious one for a home variety. The tree is vigorous, hardy, healthy, bears early, lives long, is productive, and altogether very satisfactory. The variety originated on the farm of Job Whipple, Union Springs, New York, and its fruit was first exhibited in 1849. Its culture is confined to eastern New York and nearby regions.

Tree medium to large, vigorous, spreading, open. Fruit medium to large, globular, conic, base rounding or sometimes flattened, regular, sides often unequal; stem short, sometimes long, thick; cavity acute, shallow, narrow, occasionally lipped, often furrowed, thinly russeted; calyx large, open; lobes separated and broad at the base, narrow above, long, acute; basin small, narrow, abrupt, furrowed, wrinkled; skin thin, tough, smooth, waxy, yellow, washed and mottled with red, conspicuously splashed and striped with carmine and overspread with thin bloom; dots numerous, russet or white, conspicuous, often submerged; prevailing effect striped red; calyx-tube large, wide, cone-shape; stamens basal; core axile, sometimes abaxile; cells not uniformly developed, usually symmetrical, open, sometimes closed; core-lines meeting; carpels ovate or broadly obcordate, sometimes emarginate, often tufted; seeds dark, long, acute, often many are abortive; flesh yellow, firm, fine, crisp, tender, juicy, pleasant subacid, sprightly; good to very good; from September to early winter.

WEALTHY. Fig. 60. Wealthy is a standard American apple, indispensable in cold regions and valuable wherever apples are grown on this continent. Its good qualities are: the fruits are handsome in appearance, color, size,

60. Wealthy. (×½)

and shape, in all of which they are uniform; the quality, while not of the best, is good, the flesh being especially crisp, juicy, and refreshing; the fruits stand handling and storage; the trees bear early and abundantly and at first are thrifty and healthy. Faults are: the trees fail in vigor as they reach maturity and are never of large size; the apples run small and uneven on old trees, and there is some loss from dropping. Wealthy is an ideal apple for planting as a filler among permanent trees. The variety is especially well adapted to sandy and gravelly soils. Wealthy originated from seed of the Cherry Crab planted by Peter M. Gideon, Excelsior, Minnesota, about 1860.

Tree dwarfish, vigorous, upright-spreading, open and drooping, with short, stout, curved branches. Fruit medium to large, uniform in shape, round-conic, slightly flattened at base, regular, symmetrical; stem short, long on small fruit, slender; cavity acuminate, deep, narrow, russeted; calyx closed or partly open; lobes broad, obtuse; basin narrow, abrupt, smooth, symmetrical; skin thin, pale yellow, blushed and marked with narrow stripes and splashes of red, deepening to brilliant red; dots numerous, inconspicuous, pale or russet; prevailing effect bright red; calyx-tube conical; stamens median; core small, axile or sometimes abaxile; cells symmetrical, open; core-lines clasping; carpels small, round, narrowing toward base and apex, smooth, flat; seeds dark brown, acute; flesh white, sometimes stained with red, fine, crisp, tender, very juicy, agreeable subacid, sprightly, aromatic; good to very good; October to January.

WESTFIELD *Connecticut Seek-no-further. Russet Seek-no-further. Westfield Seek-no-further.* Westfield or Seek-no-further is an old favorite distinguished by its dessert fruits of a full rich flavor and a pleasing aroma. The apples are not remarkable for size, color, or form, though not unattractive, especially in the creamy yellow color striped with red and spotted with russet. The trees are exceptionally hardy, vigorous, and long-lived, but are productive only on certain soils, the choice being warm, well-drained, fertile, sandy or gravelly loams. The variety is said to have originated at Westfield, Massachusetts, and was under cultivation as early, at least, as the Revolutionary War. The variety is well known in New England, New York, Ohio, and Michigan.

Tree medium to large, slender, vigorous, spreading or roundish. Fruit medium, sometimes large, uniform, round-conical, less often oblong-conical, obscurely ribbed, symmetrical; stem long, slender; cavity acuminate, deep, narrow, symmetrical, russeted with green- or yellow-russet; calyx small, partly open; lobes short, reflexed, obtuse; basin small, shallow, narrow, obtuse; skin tough, smooth, deep yellow, splashed with dull red, in highly-colored specimens overspread with bright red, striped with carmine; bloom thin; dots characteristically large, pale yellow, gray or russet, often areolar with russet center; calyx-tube wide, cone-shape; stamens basal; core medium, axile; cells symmetrical, open; core-lines meeting; carpels elliptical or round and somewhat truncate at the base, narrowing toward the apex, mucronate; seeds numerous, small, plump, acute; flesh pale yellow, firm, coarse, crisp, tender, breaking, juicy, mild subacid, rich, peculiarly aromatic, sprightly; very good to best; October to March.

WHITE ASTRACHAN. This is a Russian apple similar in tree-characters to the well-known Red Astrachan, but quite different in fruit. It is offered by several nurserymen in the Pacific states, but seems not to be grown east of the Rocky Mountains. The variety is a favorite in the Yolo district of California and in the valley and foot-hill regions in central coast counties. White Astrachan is an old European sort, known under many names in Europe, which has been more or less grown in the United States for nearly one hundred years. The only descriptions to be found are brief ones in the old fruit-books from which the following is compiled:

Tree very hardy, rather compact, vigorous, fairly productive; somewhat subject to blight. Fruit medium to large, round or round-oblate, waxen-yellow or whitish, with faint streaks of red and sometimes with a pink blush; flesh white, acid, highly prized for culinary purposes; August and September.

WHITE PEARMAIN. *White Winter Pearmain.* White Pearmain, possibly better known as White Winter Pearmain, was one of the highly prized possessions of the pioneers

of Ohio and Indiana, having been brought to these states as grafts in the days of saddle-bag transportation. It is thought to be an old sort renamed, but what it is no one knows. The apples are very good to best in quality, a little too mild for culinary uses, not particularly attractive in appearance, neither shape nor color appealing to the eye. Its cultivation is largely confined to the states mentioned, though it has been somewhat planted in the Far West.

Tree vigorous, spreading. Fruit medium to large, uniform in size, round-oblate, round or oblong-conic, ribbed, symmetrical; stem medium to long; cavity small, acute, deep, narrow, furrowed, sometimes russeted; calyx large, usually closed; lobes long, acute; basin small, oblique, shallow, obtuse, often distinctly furrowed, wrinkled, pubescent; skin tough, smooth, waxen, pale yellow, with a shade of brownish-red; dots numerous, pale or russet, often submerged, usually large and much elongated about the cavity; calyx-tube long, conical; core medium to large; cells closed or partly open; core-lines clasping; carpels flat, broad or round-cordate, emarginate, mucronate, tufted; seeds light brown, large, wide, plump, obtuse, tufted; flesh yellow, firm, fine-grained, crisp, tender, juicy, mild subacid, sprightly, pleasantly aromatic; good to best; December to March.

WHITE PIPPIN. *Canada Pippin.* Because of similarity in color and in having an oblique axis, fruits of this variety are often confounded with those of Green Newtown Pippin, but here the similarities end; for, in flesh and flavor, the last-named apple is much superior, while in tree-character White Pippin is usually the better. The fruits of White Pippin are larger, and the blush is not so well marked, nor do they keep so long. The apples are yellow with a sprightly, subacid, very good flavor, keeping until February in ordinary storage. The trees are thrifty, bear young, are hardy and healthy, and yield large crops almost annually. The variety is gradually passing out of cultivation, though it would seem to be too good to be wholly lost. Its origin is not known, but since the fruits were described from old trees in 1848, it must be more than a century old. It is most commonly grown in New York and New England.

Tree large, vigorous, upright-spreading, dense. Fruit medium to large, uniform in size and shape, round or round-oblate, irregular or angular, sometimes symmetrical; stem short; cavity large, acute, deep, narrow, often wavy, sometimes lipped, partly russeted and often with a strip of russet extending out on one side; calyx small, closed or partly open; lobes long, narrow, acuminate; basin small, shallow, narrow, abrupt, usually furrowed and wrinkled; skin pale yellow, sometimes blushed, mottled and striped with thin brownish-red; dots small, characteristically white and submerged, or green with fine russet point, scattering, large, irregular and russeted toward the cavity; prevailing effect yellow; calyx-tube long, narrow, elongated conical; stamens median; core small, abaxile with hollow cylinder in the axis; cells not uniformly developed but usually symmetrical, closed or open; core-lines clasping; carpels round to ovate or elongated and narrow, sometimes emarginate, tufted; seeds small, plump, narrow, elongated, acuminate, brown to dark brown; flesh yellow, firm, fine-grained, tender, crisp, juicy, sprightly subacid; good or very good; November to April.

WILLIAMS. *Lady's Apple. Queen. Williams Early. Williams Red.* Beautiful bright red color and rich, agreeable flavor characterize the fruits of Williams. As with so many of the tender-fleshed dessert apples, the fruits do not stand shipping well and cannot be kept long. Ordinarily, the apples are large, but with a heavy crop many of them may be small and uneven in size, and they ripen so unevenly that more than one picking is required. The trees are only moderately vigorous, but are healthful and fruitful. Williams originated in Roxbury, Massachusetts, about 1750, and for a century and a half has been a favorite in New England and the Middle Atlantic states.

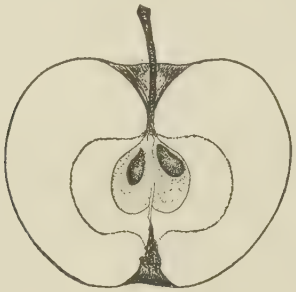
Tree small, upright-spreading, dense. Fruit medium or large, uniform in size and shape, oblong-conic or round-conic, broadly ribbed, sides often unequal; stem medium to long, thick; cavity obtuse, shallow, broad, furrowed, sometimes russeted; calyx usually closed; lobes long; basin shallow, narrow, abrupt, furrowed; skin thick, tender, smooth, pale yellow overlaid with bright, deep red, striped with dark red; dots numerous, inconspicuous, gray or russet; calyx-tube long, narrow, funnel-shape, sometimes extending to the core; stamens marginal; core large, axile; cells closed; core-lines clasping; carpels ovate; seeds narrow, long, plump, acute, dark brown; flesh white sometimes tinged with red, firm, coarse, crisp, tender, juicy, becoming dry when overripe, pleasant mild subacid, aromatic; good; August and September.

WILLOW TWIG. *Willow Leaf. Willow.* Once seen, the tree of this variety can always be recognized by its slender drooping twigs. The tree is further characterized by strong, vigorous, healthy growth, early bearing, and productiveness. Despite the fact that the variety is of value only in the South, the tree is comparatively hardy. The crop requires a long and warm season for full development. The apples are large, symmetrical, shapely, with dull red as the prevailing color—not at all striking in appearance. Nor would the quality of the apples attract attention, the flesh being coarse and the flavor but fairly good. The character by virtue of which Willow Twig has gained eminence in the Central Mississippi Valley, where it is chiefly grown, is length of season, as few apples keep longer. The origin of the variety is not known, but probably it is an old sort brought to new life in Ohio about 1848.

Tree large, vigorous, upright-spreading with terminals drooping. Fruit large, round-conic, sometimes round-oblate, regular or faintly ribbed, symmetrical; stem short; cavity acute, deep, wide, often irregular or compressed, sometimes lipped, smooth, green or red, with pale dots sometimes thinly russeted; calyx small, closed; basin wide, irregular or compressed, deep, often abrupt, sometimes ridged, wrinkled; skin smooth, pale yellow or dull green, mottled and blushed with red and irregularly striped and splashed with deeper red; dots numerous, large, russet-gray or yellow; prevailing color dull red; calyx-tube long, narrow, funnel-shape; stamens marginal; core axile; cells not uniformly developed, symmetrical, closed or partly open; core-lines clasping; carpels thin, flat, broadly round, narrowing toward the base; seeds large, flat, wide, plump, blunt; flesh yellow, firm, coarse, crisp, tender, juicy, sprightly, aromatic; fair to good; January to May.

WINDSOR. Fig. 61. *Windsor Chief.* Windsor has recently come to the notice of northern apple-growers because it is endowed with a constitution which enables it to stand rigorous climates. The trees come into bearing early, bear regularly and heavily, and hold their crop well. The apples are somewhat

conspicuous by reason of the large areolar dots centered with russet, which, mingled with flecks of russet, plentifully besprinkle the rather dull red skin. The flesh is somewhat

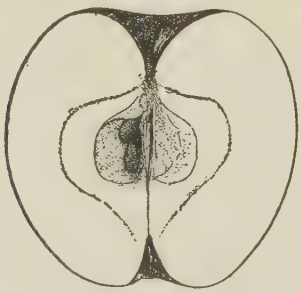


61. Windsor. (×½)

coarse, but is juicy, aromatic, and rather well flavored, though possibly a little too neutral to be called very good. The variety was first described in 1889.

Fruit above medium, round-conic varying to oblate, broad, flat at the base, often one-sided and faintly ribbed; stem medium to long, slender; cavity large, obtuse to acute, wide, deep or sometimes shallow, russeted and with coarse, outspreading russet rays; calyx small, closed or partly open; lobes small, connivent, acute, pubescent; basin abrupt, shallow to deep, wide, furrowed, wrinkled; skin thick, smooth, waxy, pale yellow or greenish, blushed with thin, dull red or in highly-colored specimens predominantly deep red, obscurely striped with dull carmine; dots characteristically large, dull, pale, often areolar with russet center, sometimes mingled with flecks of russet; calyx-tube funnel-form; stamens median or below; core small, axile; cells closed; core-lines clasping the funnel cylinder; carpels broad, narrowing toward base and apex, tufted; seeds variable, narrow to wide, obtuse or approaching acute, tufted, light brown; flesh white, tinged with green or yellow, firm, fine-grained, juicy, aromatic, mild subacid becoming nearly sweet; good to very good; October to March.

WINESAP. Fig. 62. *Holland's Red Winter. Royal Red. Texan Red. Wine Sop.* Winesap is one of the most widely distributed and best known American apples. Though it has its local attachments, it may be found



62. Winesap. (×½)

thriving on both the Atlantic and Pacific seaboards and in most of the apple regions that lie between. No doubt its adaptability to various soils and climates is the chief asset of the variety, but it has excellent qualities of fruit and tree besides. The prevailing color of the apple is bright deep red, striped and blotched with dark purple, the ground color being golden yellow, which, with the smooth glossy texture and soft bloom, make this a very handsome fruit. The rotund shape, usually somewhat truncate, and always uniform and regular, adds to the attractiveness of the apples. The coarse yellow flesh, with veins tinged with red, is distinctive, as is, also, the sprightly, subacid flavor. The apples keep and ship well, though they often scald in cold storage. The trees are vigorous, come in bearing early, and on light, rich, deep, well-drained soils are remarkably productive and regular bearers; they are precariously hardy and will grow only where the season is long. As a commercial fruit, Winesap finds its best environment in parts of Virginia and in the northern states of the Pacific Coast. The origin of the variety is unknown, but it dates well back into the Colonial period.

Tree of medium size, vigorous, round-spreading, straggling and open. Leaves small, narrow. Fruit medium to large, uniform in size and shape, usually conical, sometimes round, truncate at base, regular or obscurely ribbed, symmetrical; stem short, slender; cavity small, acute, narrow, deep, symmetrical or furrowed, often lipped, often russeted or with outspreading russet rays; calyx large, closed; lobes long, narrow, acuminate; basin small, often oblique, shallow, narrow, distinctly furrowed, wrinkled; skin tough, smooth, glossy, bright red indistinctly striped and blotched with dark red over a yellow ground-color, overspread with faint bloom; dots small, scattering, white; prevailing effect deep red; calyx-tube variable, conical; stamens marginal; core small, abaxile with a hollow cylinder in the axis, narrowing toward the apex; cells uniformly developed, symmetrical, open or nearly closed; core-lines clasping; carpels broadly round, concave, slightly emarginate if at all, mucronate; seeds wide, plump, obtuse; flesh yellow, veins sometimes red, firm, coarse, crisp, juicy, sprightly subacid; good to very good; October to March.

WINTER BANANA. *Banana.* Possibly no apple of recent introduction deserves a more conspicuous place in the plantings of the amateur than Winter Banana. The fruits are large, shapely, not so uniform in size and shape as might be desired, with a most handsomely colored skin—clear pale waxen yellow with a delicate blush which sometimes deepens into a bright red. The flavor is that rich admixture of sweet and sour which characterizes most of our best fruits, while the aroma has a suggestion of musk exclusively the property of this apple. The trees are hardy, fairly vigorous, bear young, almost annually, and are usually fruitful. The season is that of Rhode Island Greening. The fruits are so easily bruised that they seldom reach the market in good condition, and the variety is thus condemned for commercial plantings. Winter Banana is said to have originated in Cass County, Indiana, but the writer has recently seen fruit brought from Holland, name unknown, which leads him to believe this to be an Old World apple that has somehow found its way to the New World.

Tree medium in size, vigorous, spreading and inclined to droop, open. Fruit large to very large, un-uniform in size and shape, round-conic, oblong-conic, or sometimes oblate, flat at the base, often irregularly elliptical and ribbed, axis sometimes oblique, sides often unequal; stem short to long; cavity large, acute, shallow, broad, gently furrowed, sometimes lipped, smooth or partly

russeted; calyx small, partly open or sometimes closed; lobes convergent or connivent, short, obtuse; basin small, often oblique, shallow, narrow or sometimes wide, obtuse, furrowed and wrinkled; skin smooth, thick, tough, waxy, pale yellow, often with a blush which in well-colored specimens deepens to dark red; often a suture line extends from the basin to the cavity; dots numerous, white and submerged or with fine russet point; prevailing effect yellow; calyx-tube wide above, short, cone-shape; stamens median; core small, abaxile; cells not uniformly developed, usually symmetrical and open, sometimes closed; core-lines clasping; carpels elongated-ovate, narrow, emarginate, tufted; seeds often abortive, small to large and more or less irregular, obtuse, dull, dark brown, sometimes tufted; flesh pale yellow, firm, coarse, crisp, tender, juicy, mild subacid, aromatic; good to very good; October to March.

WINTERSTEIN. Winterstein is a seedling of Gravenstein, which it resembles in fruit and tree, but the fruit keeps much longer—as long as that of Baldwin. The variety is favorably spoken of in the Pacific states, but seems to be little grown east of the Rocky Mountains. Winterstein originated with Luther Burbank, Santa Rosa, California, about 1898.

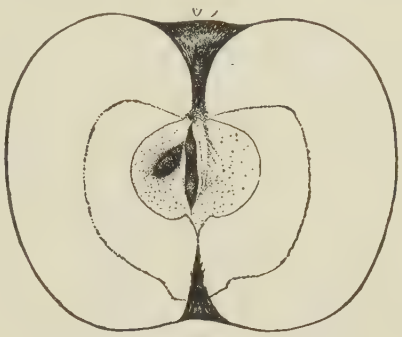
Tree upright, vigorous, hardy, fairly productive, bearing every year in the West. Fruit medium to large, not uniform, oblate or round-oblate, slightly ribbed, sides unequal; stem long, slender; cavity obtuse, narrow, smooth, compressed; calyx open, medium size; basin medium, narrow, obtuse, furrowed; skin greenish-yellow overlaid with dull red stripes and splashes of deeper red; dots medium in size, scattered and russet; core medium size, closed, axile; core-lines meeting; calyx-tube short, wide, conical; flesh yellowish-white, firm, fine, crisp, tender, juicy, subacid, sprightly; good for culinary purposes; November to April.

WINTER SWEET PARADISE. *Winter Paradise. Honey Sweet. Paradise Winter.* Seldom found in orchards, this old variety is still offered by nurserymen. It is doubtful whether it has characters sufficiently good to make its cultivation worth while. It originated with a Mr. Garber, Columbia, Pennsylvania, nearly a century ago. The tree is described as vigorous, upright, very productive, but not an early bearer. The fruit is large, round, oblate, dull green with a reddish-brown blush. The flesh is fine-grained, juicy, and sweet. The season is early winter and midwinter.

WISMER. *Wismer's Dessert.* This apple, of Canadian origin, seems to be little grown in Canada or the East, but is listed by several western nurserymen. According to all reports, it might well be tried out in eastern apple-growing regions, its merits being hardiness of tree, productiveness, and handsome appearance and good flavor of the fruit. In color of fruit, it is said to resemble Esopus Spitzenburg. The variety originated with J. H. Wismer, Port Elgin, Ontario, in 1897.

Tree large, vigorous, upright-spreading, round-topped, productive. Fruit medium to large, oblong-conic, sometimes oblique, strongly ribbed; stem long, slender; cavity acute, deep, slightly russeted, sometimes furrowed; calyx small, closed; basin rather deep, wide, abrupt, furrowed and wrinkled; skin thin, tender, smooth, waxen, pale yellow overspread with stripes and splashes of carmine; dots large, numerous, conspicuous, russet; core very large, open, abaxile; core-line clasping; calyx-tube long, wide, conical; seeds medium, wide, obtuse; flesh yellow, firm, crisp, rather dry, mild subacid, aromatic; good; November to April.

WOLF RIVER. Fig. 63. Wolf River is of note chiefly for its very large apples. The fruits resemble those of the better-known and more desirable Alexander in color, shape, and quality; but average larger and are rounder and less conical. The tree is very hardy and



63. Wolf River. (×½)

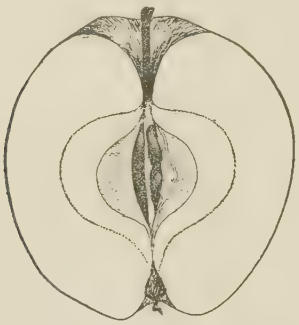
thrifty, but is only moderately productive. In the West, many prefer tree and fruit to the Alexander—not so in the East. The variety originated on the farm of W. A. Springer, Wolf River, Wisconsin, and was first described in 1875.

Tree large, vigorous, spreading, open, drooping. Fruit very large, uniform in size and shape, broad and flat at the base, conic or round, often irregular; stem short, thick, not exserted; cavity acuminate, deep, wide, heavily russeted; calyx large, open or closed; basin deep, narrow, abrupt, usually smooth, broadly furrowed; skin thick, pale yellow, mottled and blushed with bright, deep red and marked with conspicuous splashes and broad stripes of bright carmine; dots numerous, large, areolar, depressed, pale or russet; calyx-tube conical; stamens median; core large, abaxile; cells closed or partly open; core-lines clasping; carpels broadly cordate, emarginate, tufted; seeds dark brown, wide, short, plump, obtuse; flesh white tinged with yellow, firm, coarse, tender, juicy, subacid, aromatic; fair to good; September to December.

YATES. It is almost impossible properly to place this variety. Some writers maintain that it is identical with the old Nickajack, which, in the South, has many synonyms. Southern catalogs which describe Yates agree only that the variety is a favorite in Georgia; that it probably formerly came from there; and that the apples are of small size, dark red with white dots, firm, juicy, and aromatic. The trees are described as vigorous, healthy, and heavy bearers. From the fact that it is listed by nearly all southern nurserymen, it would seem that Yates is still popular in many parts of the South.

YELLOW BELLFLOWER. Fig. 64. *Bellflower. Lady Washington. Lincoln Pippin.* Yellow Bellflower is distinguished by its unique fruits. The apples are oblong-conic with very prominent ridges at the apex, and with a smooth, delicate, pale, lemon-yellow, waxen skin usually beautifully blushed on the cheek to the sun. The fruits are not suitable for dessert, the flavor being a little too austere,

but are unsurpassed for culinary purposes. Unfortunately, the apples are variable in size and shape, and the tender skin is easily injured, so that the variety is not profitable in commercial orchards. Fruit and foliage are



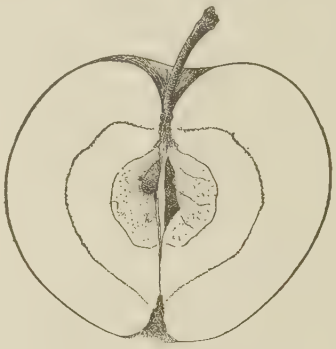
64. Yellow Bellflower. (×½)

very susceptible to injury by the apple-scab fungus. The apples do not stand storage well, and deteriorate quickly when brought from low temperatures. The trees are vigorous, healthy, hardy, long-lived, and productive in warm, well-drained, fertile soils. The variety has strong local attachments, and, though widely distributed, is now being planted in but few localities. The most suitable regions for its culture are the coast valleys of California. In 1817, Coxe reported that the original tree was still standing near Crosswicks, New Jersey.

Tree medium to large, vigorous, upright-spreading, laterals drooping. Fruit large or very large, round-oblong, oblong-conic, or ovate, irregularly elliptical, ribbed, often with prominent ridges at the apex, sides usually unequal; stem long, slender; cavity large, acute, deep, wide, furrowed, sometimes compressed, sometimes lipped, usually with outspreading broken rays of brownish-red in the sun which in highly-colored specimens deepens to a blush; calyx below medium to above, closed or partly so; lobes narrow, acuminate, pubescent; basin small, oblique, abrupt, narrow, shallow to rather deep, distinctly ridged and wrinkled; skin smooth, bright, pale lemon-yellow varying to whitish in the shade and often with a shade of brownish-red in the sun which in highly-colored specimens deepens to a pinkish-red blush; dots white or russet, numerous and small toward the basin, large, irregular and scattering toward the cavity; prevailing effect bright yellow; calyx-tube elongated funnel-shape, sometimes extending to the core; stamens median; core large, long, remarkably abaxile; cells unsymmetrical, wide open or partly closed; core-lines clasping; carpels long, narrow, round-obovate, concave, much tufted; seeds large, long, obtuse; flesh yellow, firm, crisp, fine-grained, tender, juicy, aromatic; very good; October to March.

YELLOW NEWTOWN: See Green Newtown.

YELLOW TRANSPARENT. Fig. 65. Yellow Transparent is more readily characterized by its faults than by its virtues. Earliness is the chief asset of the variety, though, if not over-ripe, the apples are very good culinary fruits, and at the proper stage of maturity are acceptable for dessert. The apples are above medium size, and have a clear, clean yellow color. The chief faults are: the fruits on old trees run small and uneven in size and shape; the tender flesh shows bruises readily; and the fruits can never be kept long nor shipped far. The trees are small and lack health and productiveness, but come in bearing very early

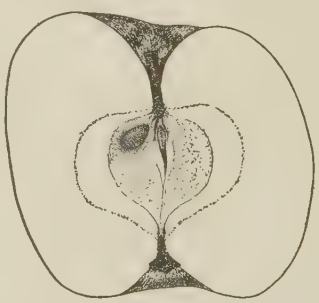


65. Yellow Transparent. (×½)

and are extremely hardy. The variety was imported from Russia in 1870, and is now grown north and south from the Atlantic to the Pacific.

Tree of medium size, vigorous, upright becoming spreading, dense, with short, stout, crooked branches filled with short spurs. Fruit sometimes large, uniform in shape and size, round-oval, round-conic or oblate-conic, ribbed, sides unequal; stem medium to long, thick; cavity acute, medium to deep, narrow, sometimes lipped, sometimes russeted; calyx closed; lobes medium in length, broad; basin shallow, narrow, abrupt, furrowed and wrinkled; skin thin, tender, smooth, waxy, pale yellow changing to yellowish-white; dots numerous, light colored, often submerged; calyx-tube conical; stamens marginal; core medium in size; cells partly open to wide open; core-lines clasping; carpels broadly ovate; seeds wide, flat, obtuse; flesh white, firm, fine-grained, crisp, tender, juicy, sprightly subacid, with a pleasant but not high flavor; good; July and August.

YORK IMPERIAL. Fig. 66. *Johnson's Fine Winter.* York Imperial is a popular southern apple, more generally cultivated in the Virginias and neighboring states, possibly,



66. York Imperial. (×½)

than any other variety. The apple is easily recognized by its bright red color, indistinctly striped with carmine, and by the shape of the fruit, both ends being distinctly truncate and the axis very oblique, so that the apples are

lopsided—an objectionable defect when the fruits, fit only for culinary purposes, are to be pared with a machine. The flesh is coarse and the flavor not inviting to most tastes. The apples keep and ship exceedingly well. These qualities give the variety its chief value, though the trees are very satisfactory in soils and climates to which they are adapted. York Imperial can be grown well only on heavy fertile soils, such, usually, as have a substantial foundation of clay. In the North, the apples are deficient in size, color, and quality. The variety takes its name from York, Pennsylvania, where it originated soon after the Revolutionary War.

Tree vigorous, upright-spreading, dense. Fruit uniform in size and shape, medium to large, round-oblate, usually with an oblique axis; stem short; cavity large, acuminate, deep, broad, often gently furrowed, smooth and green or partly russeted; calyx small, closed or partly open; basin large, abrupt, deep, wide, often furrowed; skin tough, bright, smooth, yellow blushed with light red and striped with carmine; dots pale or russet, conspicuous, numerous toward the eye, scattering, very large and elongated toward the cavity where they are often mingled with narrow, broken streaks of gray scarf-skin; calyx-tube elongated-cone-shape; stamens median; core small, axile; cells usually symmetrical, closed or partly open; core-lines clasping; carpels broadly round, emarginate, sometimes tufted; seeds few, dark, wide, flat, obtuse, compactly filling the cells; flesh yellow, firm, crisp, coarse, tender, juicy, sprightly subacid, becoming mild subacid, aromatic; good; November to April.

CHAPTER IV

VARIETIES OF CRAB-APPLES

Books and magazines dealing with fruits list fifty or sixty crab-apples, but not more than fifteen or eighteen are mentioned in nursery catalogs. In the cold Northwest, the culture of hardy fruits is being encouraged, and the crab-apple, therefore, is receiving much attention, new varieties being introduced almost annually. The number is certain to increase greatly in the near future. Unfortunately, these new varieties seem not to have been described, so that a few cannot be portrayed at all in this text, while others have but brief discussions compiled from the catalogs of nurserymen. Nearly all of the varieties admitted to this list, however, are growing at Geneva, New York, and full descriptions have been made from these plants.

BRIER. *Brier's Sweet Crab. Van Wyck.* Brier is a cross between the Bailey apple and Siberian crab. The variety has no remarkable qualities, and is grown only in Wisconsin, in which state it originated, at Baraboo, soon after the Civil War.

Tree vigorous, hardy, comes into bearing young and is productive. Fruit large, round-conic, ribbed; stem long, slender; cavity narrow, deep, russeted; calyx small, closed or slightly open; basin deep, narrow, abrupt, wrinkled; skin pale yellow washed with lively red, striped with carmine, dotted and flecked with yellow and covered with thin bloom; calyx-tube conical; stamens median; core medium in size; cells closed; flesh yellow, rich, fine-grained, juicy, pleasant, sweet, aromatic; good; September and October.

CHERRY. This crab is remarkable for the large size, productiveness, and regularity in bearing of the trees, which may be further distinguished by their long, slender, curved branches. The fruits are small, red, and rather too coarse to be wholly acceptable. Cherry is an old variety of unknown origin.

Tree vigorous, upright-spreading, open, with long, slender, curved branches. Fruit small, oblate-round, ribbed; stem long to very long, slender, bracted; cavity broad, shallow, obtuse, russeted; calyx medium to large, usually closed, eventually deciduous; basin wide, shallow, obtuse, wrinkled; skin pale yellow covered with bright red, often striped with carmine and overspread with thin bloom; dots distinct, numerous, large, white or russet; calyx-tube funnel-form; stamens marginal; core large, axile; cells closed; carpels broadly round or elliptical, emarginate, mucronate; flesh yellow, coarse, juicy, crisp, mild subacid, astringent; fair; August to October.

CORAL. Coral takes its name from the brilliant color of the fruit—yellow, blushed with bright scarlet. The flavor is a little too mild, almost insipid. The fruit is noted for long keeping, its season being from October to February. It originated in the vicinity of Marengo, Illinois, and was first described in 1869.

Tree vigorous, spreading, comes in bearing young, annually productive. Fruit 1½ inches in diameter, round or oblong, regular; stem medium to long, slender, bracted; cavity acute, medium in width and depth, regular, usually russeted; calyx small, closed; lobes reflexed; basin very shallow, broad, obtuse, or none; skin smooth, yellow, blushed with scarlet; dots numerous, small, gray or russet; calyx-tube long, narrow, funnel-form; stamens median; core small, axile with narrow cylinder in the axis; cells closed; core-lines clasp the funnel cylinder; carpels round-ovate; seeds compactly fill the cells, small, obtuse, plump, dark; flesh yellow, breaking, juicy, crisp, sprightly, mild subacid to nearly sweet; fair to good; October to February.

CURRANT. Currant is little more than a curiosity, its small fruits being borne in currant-like clusters. It is said to be one of the hardiest of the crabs, and, since the trees are vigorous, come in bearing young, and are remarkably productive, the variety might well be used in breeding. The flesh lacks the juiciness of a good crab, and the flavor does not commend it. Downing first described the variety in 1857.

Tree vigorous, upright-spreading or round, open, with long, slender, curved branches. Fruit small, oblate, regular, uniform; stem medium to long, slender; cavity obtuse, deep, broad, symmetrical, frequently russeted; calyx sometimes deciduous, closed; lobes narrow, acute; basin deep, wide, abrupt, obscurely furrowed; skin thin, tough, smooth, glossy, yellow, striped with brilliant red, overspread with bloom; dots numerous, small, pale; calyx-tube broadly cone-shape, short; stamens marginal; core medium to large, axile; cells closed; core-lines clasping; carpels round to elliptical, emarginate; seeds light brown, medium to large, wide, obtuse; flesh yellow, firm, fine, tender, dry, subacid; poor; October and November.

DARTMOUTH. The fruits of Dartmouth are large and brilliantly colored, very prepossessing in appearance, and of fine flavor, but ripen too early for either market or home use. The trees are none too vigorous and bear only in alternate years. The variety originated in New Hampshire and was first described in 1883.

Tree vigorous, upright-spreading, open, with long, stout, crooked branches. Fruit medium to large, oblate or round-oblate, ribbed; stem long and slender, often bracted; cavity acute, broad, deep, russeted; calyx small; lobes long, reflexed; basin broad, shallow; skin pale yellow, overlaid with bright red deepening to a dark red on the exposed side, dotted with yellow and covered with heavy bloom; calyx-tube elongated-cone-shape; stamens marginal; core large, abaxile; cells open; core-lines clasping; flesh yellow, tinged with red next the skin, fine-grained, juicy, mild subacid; good; August.

EXCELSIOR. Fig. 67. Excelsior is one of the few good dessert crabs, if, indeed, it should be called a crab, for its maternal parent was Wealthy and the other the Cherry crab. The fruits are large and handsome, especially in coloring—yellow shaded and splashed with

67. Excelsior. (×½)

bright red, the latter giving the apples their prevailing color. Besides being a good dessert fruit, it is excellent for culinary purposes. The trees are exceptionally vigorous, hardy, healthy, and come in bearing young, but are productive only in alternate seasons. The crop ripens earlier than that of any other crab. The variety originated with Peter Gideon, Excelsior, Minnesota, and was first described in 1880.

Tree large, spreading, dense, with long, stout branches. Fruit very large, round-ovate to round-oblate, symmetrical; stem long and slender, sometimes bracted; cavity small, acute, narrow, shallow, often russeted; calyx large, closed; lobes reflexed; basin shallow, broad, obtuse, furrowed; skin smooth, yellow, shaded and splashed with red; dots numerous, russet; calyx-tube wide, cone-shape; stamens median; core large, abaxile; cells unsymmetrical, wide open; core-lines clasping; carpels elongated-ovate, sometimes tufted; seeds long, narrow, acute, tufted; flesh white, firm, coarse, crisp, juicy, subacid, with Siberian crab flavor; good to very good; early September.

FLORENCE. Florence is remarkable for the beauty and high quality of its fruit and the fruitfulness of its trees—desirable in every way for an early crab for either home or market plantations. Possibly, the fruits fail somewhat in being somewhat austere and astringent, but still they are rated by all as good in quality. This is another of Peter Gideon's crabs and was first described in 1886.

Tree vigorous, upright, drooping. Fruit medium in size, uniform in size and shape, oblate, faintly ribbed; stem very long, slender; cavity acute, deep, symmetrical, russeted; calyx variable, small, closed; basin very shallow, wide, obtuse, furrowed; skin thin, tough, smooth, yellowish-white overspread with brilliant red, sometimes with white bands radiating from the cavity, overspread with faint bloom; dots minute, white; calyx-tube long, wide, urn-shape or funnel-form; stamens marginal; core large; cells closed; core-lines clasping; carpels broadly obovate, emarginate; seeds small, wide, flat, obtuse; flesh yellow, coarse, crisp, tender, juicy, very brisk subacid, astringent; good; late August and early September.

GENERAL GRANT. This crab has been under cultivation since about 1890, and, while nowhere generally grown, it is still offered by several nurserymen in the East. On the grounds of the New York Agricultural Experiment Station, it is not nearly so desirable as several other crab-apples, having two rather serious faults: the fruits rot badly at the core, and the color is too dull to be attractive. The origin is not known.

Tree vigorous, of rapid growth, rather small, compact, with a slender trunk and slender branches. Fruit small to medium, oblate, slightly ribbed, uniform in size and shape; stem very long; cavity acute, deep, russeted; calyx closed, pubescent, large; basin shallow, obtuse, deeply furrowed; skin thin, tender, smooth, greasy; color greenish-yellow, almost entirely covered with a deep, dull scarlet, striped and splashed with red; dots small to large, scattering, greenish-russet; core abaxile, small, with clasping core-lines; calyx-tube very long, conical; seeds medium sized, flat on one side, obtuse; flesh firm, coarse, tender, moderately juicy, subacid; quality rather poor; September.

GIBB. Gibb is another cross between the common apple and the crab-apple, with characters that make it somewhat doubtful with which of its parents, Yellow Siberian and Fall Greening, it should be placed. The fruits are large, yellow, blushed with dull red, with remarkably yellow flesh, which is juicy, pleasantly acidulous, and very good. The trees are slow growing but eventually attain large growth, and are very hardy and fruitful. Gibb originated with George P. Peffer, Pewaukee, Wisconsin. The variety was first described in 1884.

Tree vigorous, upright-spreading, slow in growth, very hardy and very productive. Fruit large, round-oblate; stem short, thick; cavity wide, deep, regular; calyx of medium size, open; basin very wide, shallow, wrinkled; skin thin, yellow, blushed with dull red; dots white, minute; flesh remarkably yellow, firm, crisp, juicy, pleasant acid, astringent, sprightly; fair to good; early.

HYSLOP. Hyslop has long been one of the standard American crab-apples, and is widely distributed and extensively cultivated. The apples are a brilliant, dark red with heavy blue bloom, and are thickly borne in large clusters. The flesh is yellow with a tinge of red next the skin, firm, fine-grained, juicy, but eventually becoming dry and mealy. The trees are vigorous, hardy, and fruitful. The origin of the variety is unknown; Warder first set forth its good qualities in 1869.

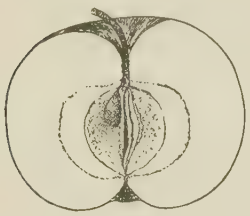
Tree vigorous, upright-spreading, open. Fruit medium to large, uniform in size and shape, round-ovate or obovate, sometimes oblong, regular or obscurely ribbed, symmetrical; stem short to very long, slender; cavity acuminate, small, shallow, narrow, sometimes furrowed, often russeted; calyx closed; lobes long, narrow, acuminate, reflexed; basin shallow, wide, distinctly furrowed and wrinkled; skin pale yellow overspread with dark red shading to deep carmine and covered with thick bloom; dots small, numerous, pale; calyx-tube short, narrow, cone-shape to urn-shape; stamens median; core medium size, axile; cells symmetrical, closed; core-lines meeting; carpels elongated-ovate, emarginate; seeds small, narrow, short, plump, obtuse, brown; flesh yellow, sometimes with tinge of red next the skin, very firm, fine, at first juicy but becoming dry and mealy, subacid, astringent; very good; late September and October.

LARGE RED SIBERIAN. This old sort, an improvement on Red Siberian, is, in its turn, being superseded by varieties having larger and handsomer fruits. Large Red Siberian differs from Red Siberian in being

larger in tree and fruit, with coarser foliage and longer and more slender twigs. Large Yellow Siberian and Yellow Siberian differ from these two varieties chiefly in having yellow fruit. All four varieties are from the Old World, but when and by whom introduced does not appear.

Tree very hardy, healthy, moderately long-lived, productive biennially and sometimes annually. Fruit of medium size, uniform in size and shape, round to round-ovate, regular; stem medium to long, slender; cavity acuminate, shallow, broad, often furrowed, usually russeted; calyx closed; lobes long, narrow, acuminate; basin shallow or none, obtuse, wrinkled, having mammiform protuberances; skin thin, tough, smooth, pale yellow, overlaid with bright red and marked with obscure, narrow stripes of dark red; dots small, light, inconspicuous; calyx-tube short, wide, urn-shape; stamens median; core medium size, axile; cells closed; core-lines meeting; carpels ovate, emarginate; seeds glossy, dark brown, small, short, wide, obtuse; flesh yellow, firm, subacid, astringent; good; September and October.

MARTHA. Fig. 68. The large fruits, handsomely colored with bright red on a yellow background, perfectly turned in oblate spheres, and the uniformity in size and shape, make Martha one of the most prepossessing of all crabs. The yellowish flesh, though a little coarse, is so crisp, juicy, and well-flavored that one is tempted to say that this is the very best crab for culinary purposes. The trees, while of but medium size and vigor, are hardy, come into bearing young, bear annually, and are usually fruitful. Furthermore, the season, late fall, makes this one of the most desirable crabs for home or market. This is another of Peter Gideon's crab-apples first described in 1839.



68. Martha. (×½)

Tree medium in size, vigorous, spreading, open, drooping. Fruit large, uniform in size and shape, round or oblate, regular or faintly ribbed, usually symmetrical, sides sometimes unequal; stem long, slender; cavity acute, broad, sometimes furrowed, often thinly russeted; calyx small, closed or partly open, occasionally deciduous; basin shallow, wide, obtuse, smooth; skin thin, tough, smooth, pale yellow almost covered with bright, light red overspread with bloom; sometimes faint narrow stripes extend from the cavity to calyx; dots numerous light colored, small; calyx-tube short, narrow, very small, conical; stamens median to marginal; core of medium size, axile; cells closed; carpels round or obovate, tufted; seeds narrow, acute; flesh yellow, firm, coarse, crisp, juicy, brisk subacid; good to very good; September to November.

MINNESOTA. In the northern part of the Great Plains, where the hardy crab-apple is a favorite fruit, Minnesota finds favor; elsewhere it is hardly known. The variety is an old one, having originated in Minnesota some time previous to 1872.

Tree rather small, compact, spreading, moderately vigorous, moderately productive, very large, round; skin pale yellow, blushed or mottled on the sunny side and overspread with thin, white bloom; flesh white, firm, crisp, juicy, fine-grained, mild subacid or nearly sweet, slightly astringent; quality good; September and October.

MONTREAL BEAUTY. This crab is listed by nurserymen in both Canada and the United States, but is now seldom found in orchards except in the vicinity of Montreal and in parts of Quebec. The variety originated in Quebec some time previous to 1833.

Tree hardy, strong, vigorous, large, upright, compact, bearing heavily but does not come in bearing early. Fruit large, oblong-conic, or round-oblong, truncate; skin yellowish-white, tender, juicy, subacid with little astringency; good; late September and October.

ORANGE. This is an old eastern crab-apple, at one time a favorite, but now seldom grown east of the Mississippi. Nurserymen on the Great Plains list it and speak well of it. Its origin is not known, but it seems to have been first described by Downing in 1869.

Tree round-topped, spreading, dwarfish, rather slow in growth, hardy, long-lived, productive, bearing annually. Fruit of medium size, round or slightly oblate; stem very long, slender; cavity open, deep, acute, with a trace of russet; calyx closed; basin very shallow, wrinkled; skin orange-yellow, often netted with russet; dots white, obscure; core open; flesh light salmon-yellow, rather dry, mild subacid with a sweet after-taste; quality good; September to November.

PAUL IMPERIAL. Paul Imperial is an English crab imported in 1888 by Ellwanger & Barry, Rochester, New York. The fruits are less attractive in appearance than those of several American crab-apples, falling short both in size and color, and are not so good in quality. The trees are only medium in size, but come in bearing young, and are very productive. This variety is said to be a cross between Red Astrachan and Siberian crab.

Tree vigorous, spreading, open, with short, stout, crooked branches having numerous small spurs. Fruit small, uniform in size but not in shape, usually oblate, often irregularly elliptical, strongly ribbed, sides unequal; stem long, slender; cavity obtuse, deep, broad, furrowed, not russeted; calyx large, closed, prominent, persistent; lobes long, broad; basin shallow, wide, obtuse, furrowed and wrinkled and sometimes mammillate; skin thin, tender, smooth, yellow, often covered with dark red, overspread with bloom; dots numerous, indistinct, light; calyx-tube small, short, wide, urn-shape; stamens marginal; core large, axile; cells closed or open; core-lines meeting; carpels round, narrowing toward apex, tufted; seeds small, wide, acute, light brown; flesh yellow sometimes stained with red, firm, coarse, crisp, tough, juicy, brisk subacid; good; September and October.

PICTA STRIATA. This crab, too small for a good commercial fruit, has a place in the crab-apple flora because of its late season. The apples are handsome but a little too mild in flavor to be generally acceptable. The variety was introduced by Ellwanger & Barry, Rochester, New York, about 1888.

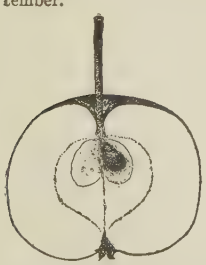
Tree large, upright-spreading with drooping laterals. Fruit of medium size, uniform in size but not in shape, oblate or round-oblate, irregularly ribbed; stem long, slender; cavity obtuse, deep, broad, compressed, smooth; calyx usually small, closed; lobes separated at base, long, acute; basin shallow, obtuse, smooth; skin thin, tender, smooth, glossy, pale yellow covered with crimson, blushed and striped with carmine; dots indistinct, gray; calyx-tube short, narrow, conical; stamens marginal; core medium to large, axile; cells open or closed; core-lines clasping; carpels round to elliptical, concave, deeply emarginate, sometimes tufted; seeds dark brown, wide, short, obtuse; flesh yellow, firm, coarse, tender, juicy, astringent, sprightly subacid; good; October to early winter.

RED SIBERIAN. This variety is not to be confused with Large Red Siberian, the fruits and trees of which are larger and the foliage coarser. Tree and fruit are ornamental, but the fruits are too small to find favor for any purpose. The variety is rapidly passing from cultivation. Red Siberian originated in France, but when and where does not appear; nor is it known when it was brought to America, although it must have been one of the first to be imported, since it was described as early as 1803.

Tree rather small, vigorous, erect, very hardy, productive, with rather long, slender twigs. Fruit small, borne in clusters, ¾ inch in diameter, round-oblate to oblong, irregularly elliptical; stem long and slender; cavity acute, medium in width and depth; calyx small to medium, often deciduous; basin but slightly depressed; skin smooth, pale yellow striped and blushed with lively red and overspread with blue bloom; flesh subacid, astringent, good for culinary uses; September and October.

SEPTEMBER. This variety, also, comes from Peter Gideon, but is not as desirable as several other of his crab-apples, though the fruits are handsome and of good quality for either dessert or culinary uses. The trees, though vigorous, have short, stout, crooked, twisted branches—serious defects which make the variety much more difficult to manage than several of its orchard associates. The variety is said to be a seedling from the Cherry crab.

Tree vigorous, spreading, open, with short, stout, crooked and twisted branches. Fruit medium to large, uniform in size but not in shape, round-oblate to oblong, sometimes conic, frequently ribbed, sides usually unequal; stem long, slender; cavity obtuse, shallow, broad, occasionally furrowed, sometimes russeted; calyx large, closed or partly open; basin mammillate, shallow, deep, obtuse; skin thin, tender, smooth, pale yellow, striped with red, in well-colored specimens nearly covered with dark red, overspread with bloom; dots small, scattering, gray or brown; calyx-tube short, broadly funnel-form, pistil point persistent; stamens median; core medium size, axile or abaxile; cells closed or wide open; corelines clasping; carpels round, elongated; seeds variable in shape, of medium size, wide, short, acute, light dull brown; flesh yellow, tender, juicy, subacid, with an agreeable crab-apple flavor; good to very good; September.



69. Transcendent. (×½)

TRANSCENDENT. Fig. 69. For many years Transcendent was the most popular crab-apple in America, its beautiful color and high quality commending it. The trees, too, are vigorous, hardy, and very productive. It is, however, a little too early in season for either home or market, and, with the advent of later and even handsomer and better flavored varieties, its popularity began to wane. It seems first to have been mentioned in 1844, but it was grown long before this. How long, or where it originated, no one knows.

Tree large, very spreading, drooping, dense, with stout, curved and drooping branches. Fruit large, round or round-oblong, flattened at the ends, somewhat ribbed; stem medium to long, stout, bracted; cavity narrow, shallow, obtuse; calyx large, closed; lobes long, leafy, reflexed; basin shallow, wrinkled; skin thin, yellow with bright red cheek, overspread with bloom, highly-colored specimens covered with bright red; calyx-tube conical; stamens marginal; core medium size; cells closed; flesh yellow, crisp, juicy, fine, somewhat astringent, subacid; very good; late August to the middle of September.

VAN WYCK. *Van Wyck Sweet.* Although this sweet crab-apple originated in Duchess County, New York, it is now seldom found in eastern United States, but is advertised by several western nurserymen. Its only value is that it is one of a few sweet crab-apples. It seems to have been first described by Downing in 1872.

Fruit large for a Siberian crab-apple, whitish shaded with bright red, covered with bloom; flesh white, tender, juicy, sweet, rich; core small, closed; quality good; August and September.

WHITNEY. *Whitney No. 20.* Whitney has in full measure all the good qualities of the best crab-apples in both fruit and tree excepting one—the season. It ripens in late August, too early to meet the demand of housewives who postpone caring for this fruit until cooler weather. For those who want a crab-apple for dessert early in the season, Whitney is about as good as any. The variety was grown from seed by A. E. Whitney, Franklin Grove, Illinois, and was first described in 1869. It is more popular in the West than in the East.

Tree of medium size, upright-spreading, with stout, long, curved branches. Fruit large, uniform in size and shape, round-conic or ovate; stem slender; cavity narrow, deep, obtuse; calyx medium to large, closed or open; basin broad, shallow, wrinkled; skin light yellow shaded and striped with red; flesh yellow, crisp, juicy, mild subacid; good to very good; late August and early September.

YELLOW SIBERIAN. *Golden Beauty.* Yellow Siberian is almost identical with Red Siberian, except in color and size of fruit. The fruits are larger than those of Red Siberian and of clear golden-yellow color. The trees come into bearing young and are reliable croppers, yielding very heavy crops annually or almost annually. The trees are very hardy but sometimes suffer from blight. The season is September.

CHAPTER V

VARIETIES OF PEARS

As compared with other hardy fruits, the pear reaches high perfection in few places in the United States, and nowhere succeeds quite so well as in parts of France, Belgium, and England. It is not surprising, then, to learn that, while the Europeans have listed about 5000 varieties of pears, current American fruit publications have never mentioned more than 1000. In 1872, the Downings described 997 varieties of pears, but many of the descriptions were from European fruit-books of varieties probably never grown on this side of the Atlantic, since the catalogs of that date offer only about 300 varieties. It is surprising, however, to find that probably not more than 100 varieties of pears are now discussed in current pomological literature, and that nurserymen's catalogs for 1920 list only 60 odd varieties, and this in spite of the fact that the pear industry in the country is now many times greater than in 1872, when fruit-books contained 1000 names of pears. Feeling that only fruits under cultivation in America should be included in this manual, the author describes only the varieties now being sold by nurserymen and sorts likely to be found in old orchards. All of the descriptions, without exception, are made from trees growing at Geneva, New York.

ANDRE DESPORTES. This old French sort is still listed by a few American nurserymen. The pears are handsome and very good in quality, but they quickly soften at the center and neither keep nor ship well. While usually of medium size, or sometimes large, the pears often run small. The variety is well worth planting in a collection, but has no value in a commercial plantation, and there are many better sorts for home orchards. The parent tree of this variety sprang from the seed-beds of M. André Leroy, the well-known authority on pomology, at Angers, France.

Tree characteristically upright and vigorous, hardy; branches slender, smooth, marked with small lenticels. Leaves 2¾ inches long, 1⅝ inches wide, ovate, stiff, leathery; apex taper-pointed; margin glandular, slightly crenate; petiole 1½ inches long. Flowers showy, 1¼ inches across, occasionally tinged pink, in dense clusters, averaging 9 flowers to a cluster. Fruit ripe in August; medium in size, 2⅞ inches long, 2¼ inches wide, obovate-obtuse-pyriform, symmetrical, uniform; stem 1 inch long, thick, curved; cavity obtuse, shallow, dotted with russet, often lipped; calyx small, open; lobes separated at the base, short, narrow, acute; basin shallow, narrow, obtuse, gently furrowed, symmetrical; skin thin, tender, smooth; color dull greenish-yellow, dotted and marbled with reddish-brown, blushed on the sunny side; dots numerous, small, light colored, obscure; flesh tinged with yellow, fine, tender and melting, buttery, juicy, sweet, aromatic; quality very good; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds small, wide, plump, acute.

ANGOULEME: See Duchesse d'Angoulême.

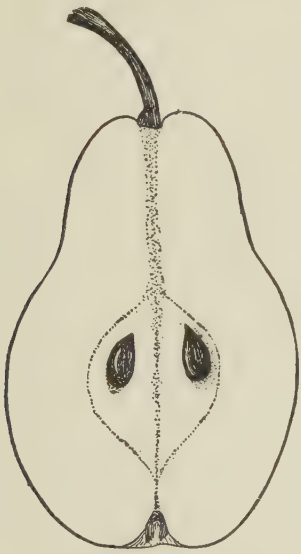
ANJOU: See Beurré d'Anjou.

ANSAULT. The fruits of Ansault rival those of Seckel in quality. In particular, the flesh is notable, being described by the term "buttery" rather better than that of any other pear. The rich sweet flavor and distinct but delicate perfume contribute to making the fruits of highest quality. Unfortunately, the pears are small, and the green coat, nearly covered with russet dots and markings, is dull, though enlivened somewhat at full maturity by a rich yellow. The tree is vigorous, productive, bears annually, and is not more subject to blight than that of the average variety. While not at all suitable for commercial orchards, Ansault should find a place in every collection of pears for home use. This pear was raised from seed in the nurseries of M. André Leroy, Angers, France. The parent tree bore fruit first in 1863.

Tree large, upright-spreading, hardy, very productive; branches thick, dull brownish-red, with numerous, raised lenticels. Leaves numerous, 2¾ inches long, 1½ inches wide, ovate or broadly oval, leathery; apex abruptly pointed; margin finely serrate, with small, reddish, sharp-pointed glands; petiole 1½ inches long, slender, glabrous. Flowers 1⅛ inches across, in dense clusters, 7 to 9 flowers in a cluster. Fruit ripens in late September and early October; medium in size, 2⅛ inches wide, uniform, obtuse-obovate-pyriform, slightly irregular; stem ⅝ inch long, short, thick; cavity obtuse, russeted, furrowed, slightly ribbed; calyx partly open, large; lobes acute; basin abrupt, furrowed and wrinkled; skin roughened with russet markings and dots; color dull greenish-yellow changing to pale yellow, considerably russeted about the basin and cavity with russet dots, with scattered flecks and patches of russet; dots numerous, small, russet; flesh tinged with yellow, granular at the center, melting and tender, buttery, very juicy, sweet, aromatic; quality good to very good; core closed, axile, the core-lines clasping; calyx-tube long, narrow, funnel-shaped; seeds short, plump, obtuse.

BARTLETT. Fig. 70. *Williams' Bon Chrétien. Williams.* Bartlett leads all other pears in number of trees in America. Its fruits are more common and more popular than those of any other pear. The preëminently meritorious character of Bartlett is its great adaptability to different climates, soils and situations. Thus, it is grown with profit in every pear-growing region in America and in all in greater quantities than any other sort. Another character which commends this

variety is fruitfulness—barring frosts or freezes the trees bear full crops year after year. The trees are vigorous, attain large size, bear young, live long, and are easily managed in the orchard. The pears are large, handsome, of good but not of the best quality, and keep and ship remarkably well. Bartlett is not without serious faults, however: the trees are not above the average in resistance to blight; they are not as hardy as those of some other varieties; and more than those of any other standard variety the blossoms require cross-fertilization. The fruits are satisfactory in all characters excepting quality. They lack the rich, perfumed flavor of Seckel on one hand, or the piquant, vinous taste of Winter Nelis

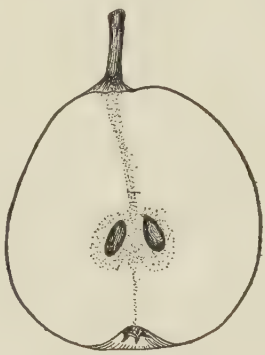


70. Bartlett. (×½)

on the other. But they are above the average in quality, and since no other variety is so easily grown, nor so reliable in the markets, Bartlett promises long to hold its supremacy for home and commercial plantations. It is the most desired of all pears by the canning trade. This pear was found as a wilding by a Mr. Stair, a schoolmaster at Aldermaston, Berkshire, England. It was first introduced to this country in 1797 or 1799 under the name of Williams' Bon Chrétien, by which name it is known both in England and France. In 1817 Enoch Bartlett, Dorchester, Massachusetts, allowed the pear to go out under his own name. Henceforth it became known in America exclusively as Bartlett.

Tree medium in size, with age becoming tall and pyriform, upright; branches stocky, smooth, reddish-brown with few lenticels. Leaves 2¾ inches long, 1⅔ inches wide, oval, leathery; apex taper-pointed; margin tipped with small dark red glands, finely serrate; petiole 1¾ inches long. Flowers showy, 1¼ inches across, in dense clusters averaging 7 buds in a cluster. Fruit matures in September; large, 3⅜ inches long, 2⅜ inches wide, oblong-obtuse-pyriform, tapering slightly toward the apex, symmetrical, uniform; stem 1⅛ inches long, often curved, thick; cavity small, usually lipped, with thin, light russet overspreading streaks of russet, acute, shallow; calyx partly open; lobes separated at the base, narrow, acute; basin very shallow, narrow, obtuse, furrowed and wrinkled; skin thin, tender, smooth, often dull, the surface somewhat uneven; color clear yellow when fully mature, with a faint blush on the exposed cheek, more or less dotted with russet and often thinly russeted around the basin; dots many, small, conspicuous, greenish-russet; flesh fine-grained, although slightly granular at the center, melting, buttery, very juicy, vinous, aromatic; quality very good; core large, closed, with clasping core-lines; calyx-tube long, wide, funnel-shaped; seeds medium in size and length, wide, plump, acute.

BELLE LUCRATIVE. Fig. 71. *Bergamote Lucrative. Lucrative. Seigneur d'Espéren.* This pear has been a standard autumn sort for nearly a century, maintaining a place for high quality with the pears of its season second only to Seckel. Flesh and flavor are



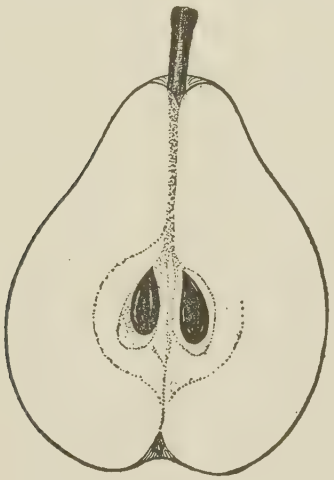
71. Belle Lucrative.

nearly perfect, but externally much more might be desired. The fruits are not as large as is desirable, and are variable in shape and color. The trees bear enormously and almost annually on either standard or dwarfing stocks; they are vigorous with a distinct upright-spreading habit of growth; hardier than the average variety of this fruit; and are more resistant to blight. The fruits are too small for a commercial product, but their delectable flavor and luscious flesh make them as desirable as any other pear for home use; besides which the trees grow so well, and are so easily managed that the variety becomes one of the very best for the home orchard. Belle Lucrative is of Flemish origin.

Tree medium in size, vigorous, upright-spreading, dense-topped, rapid-growing, hardy, productive; trunk and branches medium in thickness; branches smooth, grayish-brown mingled with red, covered with scarf-skin, with numerous, elongated lenticels. Leaves 3 inches long, 1½ inches wide, stiff; apex abruptly pointed; margin finely serrate, tipped with very small, sharp glands; petiole 2 inches long. Flowers with an unpleasant odor, showy, 1½ inches across, average 7 buds in a cluster. Fruit ripe in late September and October; medium in size, 2⅜ inches long, 2¼ inches wide, turbinate, with sides unequal; stem 1⅛ inches long; cavity very shallow and narrow or lacking, the flesh drawn up about the base of the stem; calyx open, large; lobes long, narrow, acuminate; basin shallow, obtuse, smooth; skin thin, tender, smooth; color dull greenish-yellow, thickly sprinkled with small, russet dots, often

overspread with russet around the basin; dots numerous, small, russet, conspicuous; flesh tinged with yellow, firm, fine-grained, crisp, buttery, juicy, sweet; quality very good; core closed, abaxile; calyx-tube long, narrow, funnel-shape; seeds narrow, plump, acute.

BEURRÉ D'ANJOU. Fig. 72. *Anjou. Nec plus Meuris.* Beurré d'Anjou is a standard market pear for late fall and early winter, its season lasting until well into January. As an early winter pear, it has no superior and few equals in appearance and quality of fruit. The pear is of a distinct type—large, very uniform, the sides slightly unequal, smooth of skin, yellow, marked



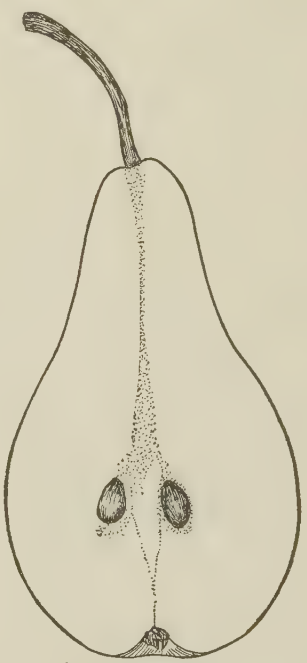
72. Beurré d'Anjou.

and dotted with russet, with a faint blush, and borne on a very short, thick stem. The yellowish-white flesh is firm but tender, slightly granular, very juicy, sweet and spicy, with a rich vinous flavor. Uniformity of shape and the smooth skin are marked and constant characters. The fruits of this pear are not always up to their best, but they are never poor in quality. The trees are vigorous, hardy, grow rapidly and come in bearing early, but have the serious fault of being uncertain croppers. Of all winter pears, none is more valuable for commercial or home orchards than Beurré d'Anjou. It is an old French pear, the origin of which is obscure.

Tree large, vigorous, spreading, hardy, an uncertain bearer; trunk smooth; branches slightly zigzag, with few small lenticels. Leaves 3½ inches long, 1½ inches wide, elongated-oval, thin, leathery; apex taper-pointed; margin nearly entire or crenate; petiole 2 inches long. Flowers 1⅜ inches across, showy, in dense clusters, from 8 to 12 buds in a cluster. Fruit ripe November-December; large, 3½ inches long, 3 inches wide, uniform in size, oblong-obovate-pyriform, with surface irregular in outline but with smooth skin, sides slightly unequal, uniform in general shape; stem ½ inch long, short, very thick and woody; cavity obtuse, shallow, slightly russeted and furrowed, usually lipped; calyx open; lobes separated at the base, long, narrow, acuminate; basin shallow, narrow, obtuse, smooth, symmetrical and regular; skin thin, tender, smooth, dull; color greenish becoming quite yellow, clouded with russet around the basin and occasionally with very fine russet lines and markings; dots many, small, russet, conspicuous; flesh white, firm but granular, tender, buttery, very juicy, sweet and spicy, with a rich aromatic flavor; quality very good; core large, closed; core-lines clasping; calyx-tube short, wide, conical; seeds large, wide, long, plump, acuminate, tufted at the tips.

BEURRÉ D'ARENBERG. The fruits of this variety are distinguished by their refreshing, vinous taste and long-keeping qualities. Very often, however, they do not ripen in eastern America, and when not properly ripened the pears are highly acidulous and so astringent as to be almost intolerable to the taste. The frequency with which these poor fruits are borne, always on heavy, cold clays and in cold climates, coupled with rather small, short-lived trees, condemn the variety for most pear regions in the East. In the far West, the crop ripens better and the pears are excellent winter fruits. The variety is an old Belgian one, the origin of which is in dispute.

Tree medium in size and vigor, upright, very hardy and very productive; trunk and branches medium in thickness and smoothness. Leaves 3 inches long, 1⅜ inches wide; apex taper-pointed; margin glandless, finely serrate; petiole 1⅞ inches long. Fruit ripe December-January; large, obovate-pyriform, ribbed; stem 1 inch long, thick, fleshy at the base, obliquely inserted; cavity lacking, drawn up in an oblique lip about the stem; calyx small, closed, lobes short, sometimes lacking; basin deep, smooth; skin roughish, thick, uneven; color greenish-yellow becoming yellow at maturity, with patches and tracings of russet especially around the calyx end; dots numerous, cinnamon-russet; flesh white, very juicy, melting, vinous or acidulous; quality very good; core large; seeds large, roundish, plump.



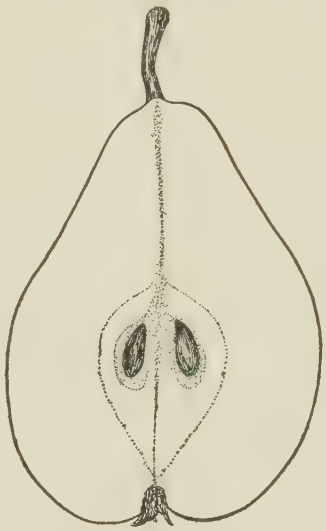
73. Beurré Bosc.

BEURRÉ BOSC. Fig. 73. *Bosc.* The fruits of Beurré Bosc are nearly flawless in every character. They at once receive approbation from all who see them by virtue of their uniquely beautiful color and shape, in

these characters being wholly unlike any other pear. The shape is pyriform with a very long tapering neck, perfectly symmetrical and unequalled in trimness of contour. The color is a dark rich yellow overspread with cinnamon russet with here and there a spot of the yellow ground color visible. The quality is "very good" or "best," Seckel alone surpassing it as a dessert fruit. The flesh is tender and melting or almost buttery, very juicy, with a rich piquant flavor and a pleasing aroma. The characters of the tree fall far short of those of the fruits; they make a poor growth in the nursery; must be humored in soil and climate; and make but a moderate growth as young plants. Established trees, however, surpass most of their neighbors in size and luxuriance of foliage. While slow in coming in bearing, after fruiting begins the trees bear regularly and abundantly. Unfortunately, the trees are tender to cold and somewhat susceptible to blight. Beurré Bosc has long been a favorite, and its culture may be recommended for the home, for local and general markets and for exportation. This pear is a native of Belgium, having been raised from seed in 1807 by Dr. Van Mons, the renowned pomologist of Louvain.

Tree medium in size, not very vigorous, upright-spreading, hardy, productive, not an early bearer; trunk medium to stocky; branches nearly smooth, brownish, with large lenticels. Leaves 3 inches long, 1⅞ inches wide, ovate, thick, leathery; apex taper-pointed; margin finely crenate; petiole 1¼ inches long. Flowers open early, 1½ inches across, showy, in dense clusters, from 10 to 20 buds in a cluster. Fruit ripe in late October and November; large, 3⅜ inches long, 2¾ inches wide, uniform in size, acute-obovate-pyriform, with a very long, tapering neck, uniform in shape and very symmetrical; stem 1½ inches long, somewhat curved; cavity very obtuse or lacking, occasionally very shallow and narrow, wrinkled, russeted, with a fleshy ring folded up around the stem, slightly lipped; calyx open, small; lobes short, broad, obtuse; basin very shallow, narrow, obtuse, smooth, symmetrical; skin slightly granular, tender, roughened by russet, dull; color dark yellow, overspread with thick, dark, attractive russet, laid on in streaks and patches, with a cheek of solid russet; dots small, light russet, obscure; flesh yellowish-white, slightly granular, tender and melting, buttery, very juicy, with a rich, delicious, aromatic flavor; quality very good to best; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds wide, short, plump, obtuse.

BEURRÉ CLAIRGEAU. Fig. 74. *Clairgeau.* Beurré Clairgeau is one of the mainstays in American pear-growing. It maintains its place among standard varieties because of excellent tree-characters, the fruits, while handsome, being of but mediocre quality. The tree is second only to that of Buffum in vigor, health and productiveness. It does equally well on quince or pear stock. On either stock, the trees bear young and usually annually. The fruits are large, smooth, symmetrical and uniform in shape, with a handsome ground color of rich yellow at maturity and a bright crimson cheek. But here praises end, for the "deceptive cheek of the Beurré Clairgeau" is proverbial in pear-growing, the handsome coat covering rather coarse, granular flesh which is sometimes good but more often commonplace. The core is very large, and the flesh surrounding it often softens prematurely. The fruit is more suitable for cookery than dessert. The pears are heavy and often drop before maturity; hence the trees should not be set in wind-swept situations. Despite these demerits of



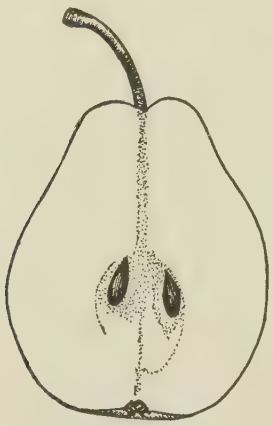
74. Beurré Clairgeau. (×½)

the fruits, the variety is well worth planting in commercial orchards for late markets. The original tree of Beurré Clairgeau appears to have grown by chance as early as 1828 or 1830 by Pierre Clairgeau, Nantes, France.

Tree below medium in size, vigorous, unusually upright, dense, slow-growing, hardy, productive, a regular bearer; trunk slender, shaggy; branches smooth, slightly zigzag, ash-gray almost completely overspreading reddish-brown, with many lenticels. Leaves very numerous, 3 inches long, 2 inches wide, broadly oval, leathery; apex abruptly pointed; margin glandless, finely serrate; petiole 2 inches long, glabrous. Flowers 1½ inches across, showy, in rather dense clusters, averaging 7 buds to a cluster. Fruit in season late October and November; large, 3⅝ inches long, 2⅝ inches wide, uniform in size, roundish-acute-pyriform, with a long, tapering neck, symmetrical, uniform in shape; stem ½ inch long, short, very thick and fleshy; cavity obtuse, very shallow and narrow, with practically no depression, fleshy around the base of the stem, russeted, lipped; calyx open, large; lobes separated at the base, long, broad, acute or acuminate; basin shallow, narrow, obtuse, furrowed, often compressed; skin thick and granular, tough, smooth, glossy; color yellow at maturity, with bright pinkish-red blush, becoming nearly crimson in highly colored specimens; dots many, small, russet, conspicuous; flesh white, quite granular, firm at first but becoming tender and melting at maturity, buttery, very juicy, sweet, aromatic, with a rich, vinous flavor; quality very good to best; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute.

BEURRÉ DIEL. Fig. 75. *Diel.* The catalogs and text-books supply Beurré Diel with several virtues which Nature denies it. As grown in the eastern United States, the pears are dull and unattractive even at maturity when the pale lemon color is brightest. If the tree is happily situated as to soil and care, the quality of its product is excellent, its fruits

being delicious and ranking among the very best, but when illy suited to soil, climate or care, the flesh is coarse, the flavor insipid and astringent, bringing the quality down to second or third rate. The pears keep and ship well. The tree is hardy, uncommonly vigorous and fruitful, but very subject to blight; it is char-



75. Beurré Diel. (×½)

acterized by its long twisting branches which need to be pruned back heavily. The variety is still being planted, but there are better autumn pears. This pear was derived from a chance seedling found in 1805 by M. Meuris, Brussels, Belgium.

Tree medium in size and vigor, spreading, open-topped, slow-growing, hardy, productive; trunk slender, smooth; branches slender, twisting, reddish-brown, with few lenticels. Leaves 2¾ inches long, 1¾ inches wide, oval, thick, leathery; apex abruptly pointed; margin finely serrate; petiole 1½ inches long. Flowers open early, 1⅜ inches across, showy, in dense clusters, 7 or 8 buds in a cluster. Fruit ripe in November; large, 3 inches long, 2⅜ inches wide, uniform in size, obovate-obtuse-pyriform, often irregular and usually with sides unequal; stem 1¼ inches long, thick, curved; cavity obtuse, shallow, very narrow, russeted, furrowed and uneven, often lipped; calyx partly open, large; lobes separated at the base, broad, acute; basin shallow, obtuse, furrowed and uneven; skin very thick and granular, somewhat roughened by russet markings and dots; color dull greenish-yellow changing to lemon-yellow, with a faint pinkish-red blush and markings and flecks of russet; dots many, russet, very conspicuous; flesh yellowish-white, firm, becoming tender and melting, quite granular around the core, very juicy, sweet, aromatic, and rich; quality very good; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, usually plump but quite often abortive, acute.

BEURRÉ GIFFARD. *Giffard.* This is one of the few summer pears with a distinctly vinous flavor, which, with the crisp but melting flesh makes it a most refreshing summer fruit. The pears are large, somewhat like those of Beurré Clairgeau in shape and color, and ripen at a time—just before Clapp Favorite—when good pears are in demand. The fruits keep well and are remarkable for their small cores. The trees are quite up to the average in all characters, and surpass most of their orchard associates in hardiness and fruitfulness. This early summer pear was found as a chance seedling in 1825 by Nicolas Giffard, Foussières, France.

Tree of medium size, vigorous, very spreading, open-topped, hardy, productive; branches reddish-brown, with long, narrow, large lenticels. Leaves 2¾ inches long, 1½ inches wide, stiff; apex taper-pointed; margin almost entire, sometimes pubescent; petiole 2½ inches long, slender, reddish green; stipules very long and slender. Flowers showy, 1¼ inches across, in dense clusters, average 8 buds in a cluster. Fruit ripe in late August; averages 2⅝ inches long, 3 inches wide, obovate-acute-pyriform; stem ¾ inch long; cavity lacking, the flesh closing up symmetrically around the stem except when drawn up in a lip; calyx open, small; lobes separated at the base, narrow, acuminate; basin shallow, narrow, obtuse, almost smooth, symmetrical; skin thin, tender, smooth; color dull greenish-yellow, with a slightly dotted, dull pinkish-red blush, but often without blush; dots numerous, small, greenish and russet, very conspicuous; flesh tinged with yellow, granular at the center, melting, very juicy, sweet, highly aromatic; quality very good; core small, closed, with clasping core-lines; calyx-tube narrow, funnel-shape; seeds plump, acute.

BEURRÉ HARDY. Fig. 76. *Hardy.* Beurré Hardy is one of the good autumn pears. The fruits are usually large, handsome, and the flesh and flavor are exceptionally fine. Thus, the flesh, while a little granular at the core, is melting and juicy—in this case, as truly luscious as in any other pear. Unfortunately, the fruits do not keep well, having a tendency to soften at the core. When poorly grown the pears are quite astringent, and there is always a smack of astringency. The trees, while not large, are vigorous, hardy, productive and healthy except in being a little susceptible to blight. This is a favorite pear with nurserymen to bud or graft on the quince, since it makes a perfect union with any of the stocks in common use. Beurré Hardy does especially well in eastern United States. This is a French pear raised about 1820 by M. Bonnet in his seed-beds at Boulogne-sur-Mer.

76. Beurré Hardy. (×½)

Tree medium in size, vigorous, upright, dense-topped, rapid-growing, hardy, productive; branches smooth, dull brown overspread with gray, with very numerous, large, elongated lenticels. Leaves 2½ inches long, 2 inches wide, stiff; apex abruptly pointed; margin tipped with small glands, finely serrate; petiole 1½ inches long. Flowers 1¼ inches across, well distributed, average 9 buds in a cluster. Fruit in season late September and early October; large, 3 inches long, 2¼ inches wide, uniform, obtuse-pyriform, with a long neck, symmetrical; stem ⅞ inch long, thick, curved; cavity obtuse, shallow and narrow, russeted, often uneven and gently furrowed, lipped; calyx large, open; lobes broad, acute; basin shallow, narrow, obtuse, gently furrowed; skin granular, tender, russet; color dull greenish-yellow, overspread with thin, brownish-russet, without blush; dots numerous, russet, small, very conspicuous; flesh granular, melting, buttery, very juicy, sweet, richly aromatic and somewhat vinous; quality

very good to best; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute.

BEURRÉ DE JONGHE. A prime requisite in any pear of best quality is that there be no disagreeable aftertaste in the flesh. The fruits of almost none of the winter pears meet this requirement, but those of this variety are wholly free from this astringency and are, moreover, sweet, rich, and delectable. The pears ripen in January and may be kept for a month or six weeks at a season when there are few other sweet, rich pears, the fruits of nearly all other pears at this season being vinous and piquant. The trees are hardy and productive, but are slow in coming in bearing, rather small, not at all self-assertive, and must be coddled somewhat. They do better on quince than on pear stocks. The variety is desirable only for the amateur. M. J. de Jonghe found this pear in 1852 at Uccle, Belgium.

Tree medium in size and vigor, spreading, slow-growing, hardy, very productive; trunk slender, shaggy; branches reddish-brown. Leaves 2¾ inches long, 1½ inches wide, thick; apex abruptly pointed; margin glandular, finely serrate; petiole 1½ inches long, reddish-green. Flowers 1¼ inches across, 7 or 8 buds in a cluster. Fruit ripens December-January; medium in size, 3 inches long, 2¼ inches wide, obovate-obtuse-pyriform, very regular; stem short, thick, inserted obliquely; cavity very shallow or none, the flesh often drawn up in a lip on one side of the stem; calyx small, open; basin shallow; skin thin; color dull greenish-yellow becoming yellower at maturity, thickly overspread with a pale, brownish-russet, often with traces of a russet-red blush; dots numerous, small, dull russet; flesh nearly white, fine-grained, melting, buttery, pleasantly flavored, aromatic, sweet; quality very good.

BEURRÉ SUPERFIN. Fig. 77. *Superfin.* Tender in skin and delicate in flesh, the product of this variety is not for the markets, but that of few other sorts, however, so admirably supplies those who want choicely good fruits. The pears are not attractive in appearance, but are hardly surpassed in flavor in their season. The flesh is notable for juiciness, rich, vinous flavor, and pleasant perfume. The trees are large, healthy, very productive, and are easily suited as to soils. The trees do not bear early, but are regular in bearing after this life event begins. In Europe, the variety is successfully grown as a dwarf, and the pear-growers of a generation ago in America recommend this variety as one of the good sorts to work on the quince. The variety is a valuable one for home orchards. Beurré Superfin was raised from a bed of pear seeds made at Angers, France, by M. Goubault in 1837.

77. Beurré Superfin. (×½)

Tree large, vigorous, upright-spreading, dense-topped, hardy, very productive; trunk unusually stocky, roughish; branches thick, rough and shaggy, zigzag, dull brownish-red, sprinkled with numerous, elongated lenticels. Leaves 3¼ inches long, 1⅞ inches wide, stiff; apex abruptly pointed; margin tipped with small glands, coarsely serrate; petiole 1¾ inches long. Fruit matures in October; large, 3¼ inches long, 2¾ inches wide, roundish-oblate, with a short, thick, rounded neck, symmetrical; stem 1⅛ inches long, very thick, curved; cavity very shallow and narrow or lacking, the flesh tapering into the stem or wrinkled in a fleshy fold about the base of the stem, often lipped; calyx open; lobes separated at the base, broad; basin narrow, obtuse, gently furrowed, symmetrical; skin very granular, tender, smooth; color dull yellow, netted and streaked with light russet, often with a slight brownish-russet cheek; dots numerous, small, russet, conspicuous; flesh tinged with yellow, granular, melting, buttery, very juicy, sweet, rich, with brisk vinous flavor, aromatic; quality very good; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute.

BLOODGOOD. Bloodgood has long been a standard summer pear in America, surpassing any European associates of its season, in both fruit- and tree-characters. The fruits are meritorious for flesh of fine texture, which is melting, juicy, and has a rich, sweet, perfumed flavor. The quality is variable, being very good one season and poor another. The reports of poor flavor arise from the fact that the quality is always poor if the fruit is not picked as soon as fully grown and ripened indoors. The season in New York is August. The trees are resistant to blight, healthy, hardy, bear young and regularly, are long-lived, and attain large size. The variety has little value in commercial plantations, but is prized for home use. Bloodgood seems to have been brought to notice about 1835 by James Bloodgood, Flushing, Long Island.

Tree upright, dense, slow-growing, productive; branches zigzag, reddish-brown, marked with few small lenticels. Leaves 2¼ inches long, 1⅜ inches wide, oval, leathery; apex taper-pointed; margin finely serrate; petiole 1¼ inches long, slender, tinged red. Flowers early, 1¼ inches across, in dense clusters, 7 or 8 buds in a cluster. Fruit matures in late August; medium in size, 2 inches long, 2⅛ inches wide, roundish-pyriform to acute-pyriform, symmetrical, uniform, with equal sides; stem ¾ inch long, thick; cavity russeted, lipped, drawn up in fleshy folds about the stem; calyx open, small; lobes separated at the base, short, broad, obtuse; basin narrow, obtuse, smooth, symmetrical; skin thick, tough, roughish; color bright yellow, with patches and nettings of russet, producing a mottled russet effect; dots many, small, russet; flesh tinged yellow, granular, melting, buttery, rich, very juicy, sweet, highly flavored, aromatic; quality very good; core small, closed, with clasping core-lines; calyx-tube short, narrow, conical; seeds small, short, plump, acute.

BOSC: See Beurré Bosc.

BRANDYWINE. Fig. 78. Were it not that Tyson is better in tree and fruit, Brandywine, which ripens its crop with that of Tyson, could be put down as the best pear of its season. Tyson is the better variety, however, and Brandywine has a place in the American pear flora only because the pears have a distinct flavor which gives them the charm of individuality. The flesh is neither sweet nor perfumed as is that of most pears at this season, but has the piquant smack of some of the winter pears which makes the fruits par-

ticularly refreshing. The tree is vigorous, with a handsome pyramidal top. The variety is worth planting for the sake of diversity in home orchards. The original tree, a chance

78. Brandywine. (×½)

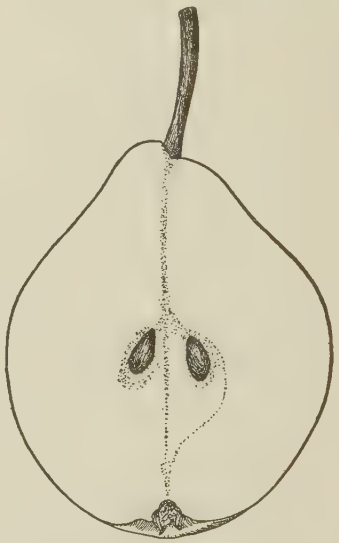
seedling, was found on the farm of Eli Harvey, Chadds Ford, Pennsylvania, on the banks of the Brandywine River.

Tree large, vigorous, very upright, dense-topped, productive; branches long, olive-gray, sprinkled with roundish lenticels. Leaves small, long-ovate; apex taper-pointed; margin serrate; petiole 1½ inches long. Flowers ⅞ inch across, in dense clusters, average 9 buds in a cluster. Fruit ripens in late August and early September; 2¾ inches long, 2½ inches wide, obovate-pyriform; stem 1½ inches long, fleshy, curved, obliquely attached; cavity lacking, the flesh drawn up in a wrinkled fold about the base of the stem; calyx large, open; lobes short, entire; basin small, shallow, usually smooth; skin roughish; color yellow, blushed with red on the sunny side, marked with tracings of russet especially near the cavity; dots numerous, large, conspicuous, russet; flesh whitish, or faintly tinged with yellow, granular, melting, juicy, aromatic, vinous; quality good to very good; core small; seeds few, small, dark brown.

BUFFUM. Buffum has meritorious characters of the tree which should keep it in the list of standard varieties. The trees are remarkably vigorous, nearly free from blight, very productive, although they have a tendency to bear biennially. The quality of the fruits is variable. At times the flesh is rich, aromatic, melting and very good; again, it may be insipid or even illy flavored, devoid of perfume, coarse in texture and poor. The fruits are never large and often run small. To attain good quality, the pears must be picked early and ripened in a moderately cool fruit-room. The culture of Buffum is on the wane, chiefly for the reason that its fruits ripen with those of Seckel and fail in competition, the Seckels being nearly as large and much better in quality. The original tree of Buffum grew in the garden of David Buffum, Warren, Rhode Island.

Tree vigorous, very upright, dense, hardy, almost immune to blight, very productive; branches shaggy, zigzag, reddish-brown, with numerous small lenticels. Leaves 3¼ inches long, 2 inches wide, oval, thin, leathery; apex abruptly pointed; margin glandular, finely serrate; petiole 2¼ inches long. Flowers 1½ inches across, showy, in dense clusters, 6 to 8 flowers in a cluster. Fruit ripe in late September and October; 2¼ inches long, more than 2 inches wide, uniform in size and shape, oblong-obovate-pyriform, with unequal sides; stem ¾ inch long, very thick; cavity obtuse, shallow, narrow, russeted, gently furrowed, often slightly lipped; calyx open; lobes separated at the base, short, narrow, obtuse; basin shallow, obtuse, gently furrowed; skin thick, tough and granular, smooth except for the russet markings, dull; color deep brownish-yellow, with a bright reddish blush on the exposed cheek toward the basin; dots many, small, brownish or russet, conspicuous; flesh white, tinged with yellow, firm, granular, stringy toward the center, juicy, sweet, aromatic; quality good; core large, closed; core-lines clasping; calyx-tube short, wide, conical; seeds large, wide, plump, acute.

CLAIRGEAU: See Beurré Clairgeau.



79. Clapp Favorite. (×½)

CLAPP FAVORITE. Fig. 79. Clapp Favorite is the standard late summer pear to precede Bartlett, which it much resembles in size, shape, color and flavor. The season is usually a week or sometimes ten days before that of Bartlett. The chief fault of the fruits is that they soon soften at the center after ripening, to obviate which they should be picked at least ten days before they would ripen on the tree. This softening at the core debars the fruit from distant markets, and makes it suitable only for local trade. The fruits are usually a little larger than those of Bartlett. The trees of Clapp Favorite are nearly perfect except that they go down quickly when blight is epidemic. Two good characters of the trees redeem the variety from failure because of blight. After those of Flemish Beauty and Tyson, the trees of this variety show greater hardihood to cold than those of any other standard sort; and of all pears in America, Kieffer not excepted, the trees of Clapp Favorite are most fruitful. Other merits of the tree are large size, vigor, longevity, and earliness and regularity in bear-

ing. The variety shows a predilection for heavy soils, and the trees may be set on the heaviest clays. Clapp Favorite is desirable wherever pears are grown in America and is one of the half-dozen leading sorts of the country. This variety originated with Thaddeus Clapp, Dorchester, Massachusetts, but the date of its origin is uncertain. It was mentioned as a promising new fruit in 1860.

Tree large, upright-spreading, round-topped, productive; trunk stocky, rough; branches characteristically shaggy, zigzag, reddish-brown, marked by few small, roundish, raised lenticels. Leaves 2½ inches long, 1½ inches wide, oval, leathery; apex taper-pointed; margin glandular, finely serrate; petiole 2 inches long. Flowers very showy, 1⅝ inches across, large, well distributed, averaging 7 buds in a cluster. Fruit ripe in late August and early September; large, 4 inches long, 3¼ inches wide, obovate-obtuse-pyriform, symmetrical; stem 1¼ inches long, thick, curved, fleshy; cavity shallow, narrow, lipped, with a fleshy ring around the stem; calyx large, open; lobes separated at the base, narrow, acuminate, erect and very stiff; basin shallow, wide, obtuse, wrinkled; skin thick, tough, smooth, glossy; color pale lemon-yellow, mottled and dotted with bright red, deepening in highly colored specimens to a crimson blush, with faint traces of russet; dots numerous, small, russet, conspicuous; flesh tinged with yellow, very granular and gritty at the center, tender and melting, buttery, juicy, sweet, rich, vinous, aromatic; quality very good; core large, closed, with clasping core-lines; calyx-tube long, narrow, funnel-shaped; seeds medium in size and width, plump.

COLONEL WILDER. Colonel Wilder originated in California and was once a favorite there, but is now little planted. At one time it was prominent in eastern orchards because of its late season and large, handsome, well-flavored fruits. The variety came in competition with Beurré d'Anjou, however, the season and fruits of the two being very similar, but the trees of Colonel Wilder were so greatly outmatched by those of Beurré d'Anjou that the new variety is less and less planted in the East. Perhaps it is worth preserving in pear collections for the sake of variety. This pear was raised by Bernard S. Fox of San José, California, about 1870.

Tree medium in size, spreading and drooping, open-topped, an uncertain bearer; trunk shaggy; branches stocky, very rough, reddish-brown, marked with many lenticels. Leaves 2¼ inches long, 1¼ inches wide, narrow, short, oval, leathery; apex abruptly pointed; margin glandless, finely serrate; petiole 2¼ inches long, slender, pale green or yellowish, sometimes with a tinge of pink. Blossoms open very late; flowers 1¼ inches across, in dense clusters, 7 or 8 buds in a cluster. Fruit in season late December to February; large, 3 inches long, 2¼ inches wide, uniform in size, ribbed, oblong-obovate-pyriform, with unequal sides; stem ¾ inch long, thick, curved; cavity small, obtuse, shallow, narrow, furrowed, occasionally lipped; calyx large, open; lobes separated at the base, narrow, acute; basin shallow, narrow, abrupt, usually smooth, symmetrical; skin thick, tough, rough, dull; color light yellow, often with a faint orange-red blush on the exposed cheek, with nettings and markings of russet; dots numerous, small, grayish and russet-colored, conspicuous; flesh yellowish-white, granular around the core, melting, buttery, very juicy, sweet, aromatic, with a musky flavor; quality good; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds wide, plump, acute.

COLUMBIA. Once a favorite in eastern United States, Columbia is planted now only in collections. When pear-growing was being attempted in the southern states, before the advent of Kieffer, Garber, and Le Conte, Columbia was the most dependable sort for the South. The pears are not attractive in appearance, nor remarkably good in quality, but the trees are vigorous, healthy and very fruitful, although they come in bearing late. This variety must not be confused with the Columbia now listed in many catalogs, the proper name of which is Barseck. The original seedling grew on the farm of a Mr. Casser, Westchester County, New York. In 1835 stock was propagated from the original tree, which was then fifteen inches in diameter.

Tree large, vigorous, upright-spreading, hardy, very productive; trunk stocky, rough; branches thick, rough and shaggy, dull brownish-red, marked with round lenticels. Leaves 3¼ inches long, 1½ inches wide, long-oval, thin; apex abruptly pointed; margin finely serrate, usually tipped with very small glands; petiole 2¼ inches long. Blossoms late; flowers 1¾ inches across, very showy, in dense clusters, 9 to 12 buds in a cluster. Fruit ripe from late November to January; large, 3 inches long, 2⅜ inches wide, uniform in size, oblong-obovate-pyriform, broad at the middle, unequal sides, uniform in general shape; stem 1 inch long, curved, thick; cavity obtuse, very shallow and narrow, smooth; calyx partly open, large; lobes narrow, acuminate; basin shallow, obtuse, slightly wrinkled; skin thick, granular, tough, rough, dull; color yellowish-green, frequently with a dotted, dull red blush on the exposed cheek; dots many, of various colors, conspicuous; flesh yellowish-white, firm, granular, rather tough, very juicy, sweet, aromatic and rich; quality good; core large, closed, with clasping core-lines; calyx-tube wide, conical; seeds narrow, very long, often flattened and abortive, acuminate.

COMICE: See Doyenné du Comice.

DANA HOVEY. Dana Hovey is a delicious little dessert pear, so juicy, sweet, and rich that it is a veritable sweetmeat. It is one of the best pears to succeed Seckel; the fruits come in season about the middle of November and keep from six weeks to two months. The flavor is that of Winter Nelis with a smack of Seckel. The pears are more brightly colored than those of Seckel, and are larger so that the fruits are more attractive. The trees are hardy, vigorous, and thrive on various soils, but are only moderately productive and are somewhat susceptible to blight. Dana Hovey is one of few winter pears with fruits of high quality, for which reason it is very desirable for home use and ought to have value in commercial plantations. Francis Dana, Roxbury, Massachusetts, introduced this pear about 1854 under the name Dana's Hovey in honor of C. M. Hovey, author of *The Fruits of America.*

Tree large, vigorous, upright-spreading, rapid-growing, productive; trunk stocky; branches reddish-brown, marked by few small lenticels. Leaves 3¼ inches long, 2⅛ inches wide, leathery; apex taper-pointed; margin glandless or with few reddish glands, finely serrate; petiole short, stocky, 1½ inches long, glabrous. Flowers 1½ inches across, in dense clusters, average 8 buds in a cluster. Fruit matures in late October and November; medium in size, 2½ inches long, 2⅛ inches wide, obovate-obtuse-pyriform, symmetrical, uniform; stem ½ inch long, slender; cavity abrupt, shallow, very small, narrow, slightly lipped; calyx partly open, small; lobes short, narrow, acute; basin shallow, narrow, obtuse, smooth, symmetrical; skin thin, tender, smooth; color golden-yellow, covered with thin russet; dots numerous,

small, greenish-russet; flesh tinged with yellow, granular at the center, tender and melting, juicy, sweet, highly perfumed, juicy, aromatic; quality of the best; core large, closed, abaxile; calyx-tube short, plump, obtuse.

DEARBORN. *Dearborn's Seedling.* Once a favorite, Dearborn is now nearly lost to cultivation. It is too good a variety to be lost, however. The fruits ripen early and are of good quality, though hardly as richly flavored as those of Elizabeth which ripen at the same time. Unfortunately the pears run small, but they are attractive in shape and color. In season, the crop succeeds that of Bloodgood, and precedes that of Bartlett. The trees are almost flawless, and are as well adapted to home orchards where fruits cannot receive the care of skilled hands, as any other pear. Besides being almost free from blight, the trees are hardy, vigorous, and very productive. The variety has many valuable qualities for a summer pear in home orchards. This pear was found in 1818 at Roxbury, Massachusetts, near the home of General H. A. S. Dearborn.

Tree large, vigorous, spreading, tall, rapid-growing, very productive; branches thick, zigzag, reddish-brown, marked by many reddish-brown lenticels. Leaves 3 inches long, 1½ inches wide, thin; apex obtusely pointed; margin with very fine dark tips, finely and shallowly serrate; petiole tinged red, 1¾ inches long, glabrous. Flowers showy, 1¼ inches across, in dense clusters, 9 or 10 buds in a cluster. Fruit ripe in late August; small, 2 inches long, 2¼ inches wide, uniform, roundish-pyriform, with a slight neck, symmetrical, uniform; stem 1 inch long, slender; cavity obtuse, shallow, narrow, thinly russeted, often lipped; calyx open, large; lobes separated at the base, narrow, acuminate; basin very shallow, obtuse, gently furrowed and wrinkled, symmetrical; skin thick, very tough, smooth, dull; color clear pale yellow, with russet specks; dots numerous, small, russet, conspicuous; flesh white, slightly granular at the center, tender and melting, very juicy, sweet but spicy, aromatic; quality good; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute.

DIEL: See Beurré Diel.

DORSET. *Late Seckel.* Dorset has been on probation for twenty-five years, but its status is not yet decided. The fruits resemble those of Seckel in shape and color, but are larger and come in season later. These external resemblances to Seckel have given it the name "Late Seckel," which, however, is a misnomer, as a taste of the two fruits at once makes plain. Dorset is not nearly as richly flavored as Seckel. The tree-characters are very good. Since there are few good late pears to follow Seckel, there may be a place for Dorset. The variety was raised from seed by Lemuel Clapp, Dorchester, Massachusetts, and was introduced in 1895.

Tree small, spreading, slow-growing, very productive, a regular bearer; trunk slender, shaggy; branches slender, smooth, reddish-brown, marked with many large lenticels Leaves 3 inches long, 1½ inches wide, oval, leathery; apex taper-pointed; margin crenate; petiole 1¾ inches long, slender. Blossoms open very early; flowers often 1⅜ inches across, showy, in dense clusters, from 8 to 12 buds in a cluster. Fruit matures in December; below medium in size, 2½ inches long, 2 5/16 inches wide, uniform in size and shape, obovate-obtuse-pyriform, with unequal sides; stem ¾ inch long, curved; cavity almost lacking, obtuse, shallow, narrow, furrowed, compressed, often lipped; calyx open; lobes separated at the base, long, acute; basin narrow, obtuse, gently furrowed; skin thick, smooth, dull greenish-yellow, marked with a dull bronze-red blush on the exposed cheek; dots many, small, grayish and russet, conspicuous; flesh yellowish-white, firm, granular at the center, tender, very juicy, very sweet and aromatic; quality good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute, broad at the base.

DOUGLAS. In regions where blight and heat make pear-growing precarious, and pears with oriental blood, as Kieffer, Garber and Le Conte, must be grown, Douglas, which belongs with the pears just named, might well be tried. It is better in flavor than any other variety of its class. The trees come in bearing remarkably early, and are as productive as those of Kieffer, though hardly as large or vigorous. The trees are inclined to overbear, in which case the fruits run small. The variety has little to recommend it, but those who grow Kieffer might put it on probation with the hope of growing a fruit passably fair for dessert. Douglas is a seedling of Kieffer crossed, it is believed, with Duchesse d'Angoulême by O. H. Ayer, Lawrence, Kansas, about 1897.

Tree medium in size and vigor, upright, very productive; trunk slender, smooth; branches slender, dull brownish-red. Leaves 3¼ inches long, 1½ inches wide, thick; apex taper-pointed; margin glandless, finely and shallowly serrate; petiole 1⅝ inches long. Flowers 1¼ inches across, white or occasionally with a faint tinge of pink, 11 or 12 buds in a cluster. Fruit matures in October; large, 3¼ inches long, 2¾ inches wide, obovate-pyriform, tapering at both ends like the Kieffer; stem 1⅝ inches long, slender; cavity deep, narrow, compressed, often lipped; calyx small, partly open; basin furrowed; skin thick, tough; color pale yellow, heavily dotted and sometimes flecked with russet; dots numerous, small, light russet or greenish; flesh tinged with yellow, firm but tender, granular, very juicy, sweet yet with an invigorating flavor; quality good; core closed, axile; calyx-tube short, wide; seeds long, plump, acute.

DOYENNÉ D'ALENÇON. This old French pear is worth planting because of its very late fruits and long season. The pears come in season under ordinary conditions in December and keep until March. The fruits are not remarkable for either taste or appearance, but are good for a winter product when there is little competition with other varieties. In some seasons the pears fail to ripen, and the variety should be planted only on warm soils and in situations where the season is warm and long. This variety is much grown in Europe on the quince. A pear of this name and season was found at Orléans in 1628, in the orchard of Le Lectier, the renowned French pomologist.

Tree upright, dense-topped, productive; trunk thick, shaggy; branches stocky, reddish-brown. Leaves 2¾ inches long, 1⅛ inches wide, thin; apex taper-pointed; margin with few glands, coarsely serrate; petiole 2⅝ inches long, glabrous, with tinge of red, slender. Flowers early, 1¼ inches across, in dense clusters, average 9 buds in a cluster. Fruit ripe December-February; 2⅜ inches long, 2⅞ inches wide, obovate-obtuse-pyriform, symmetrical, uniform; stem ¾ inch long, thick, curved; cavity obtuse, shallow, symmetrical, often slightly lipped, small; calyx open, large; lobes not separated at the base, broad; basin narrow, abrupt, smooth, symmetrical; skin very thick, tough, rough; color dull greenish-yellow with a faint orange blush on the exposed cheek, marked with many brown and russet dots and netted with russet;

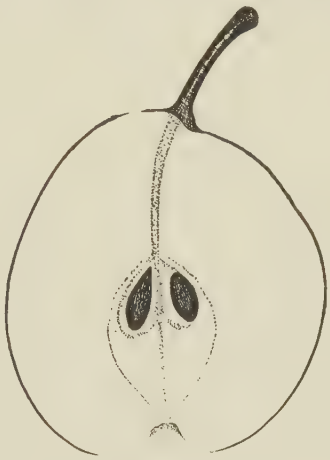
dots numerous, small, brownish-russet; flesh tinged with yellow, granular at the center, tender and melting, juicy, aromatic, with a lively vinous flavor; quality good; core large, closed, axile, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute.

DOYENNÉ BOUSSOCK. Fig. 80. *Boussock.* If the fruits were better in quality and kept longer, this variety would take rank among the best commercial sorts, for the pears are handsome and the trees are nearly flawless. The briskly acid flavor is not pleasing to many, and the fruits become soft at the center soon after ripening. The pears are above medium in size and are sometimes large or very large. The seeds are often abortive. The trees are very large and vigorous, as hardy to cold as those of any other pear, little susceptible to blight, and remarkable for their prominent buds and large, thick, glossy green leaves, which turn deep red in the autumn. On some soils the trees do not hold their crop well, and it is always best to plant them where there is protection against heavy winds. The trees are prodigious bearers, and bear regularly—characters which make the variety desirable for local markets. This pear is supposed to have been raised by the Belgian, Van Mons, at the beginning of the nineteenth century.

80. Doyenné Boussock. (×½)

Tree very large, vigorous, upright-spreading, tall, hardy, productive; trunk thick, shaggy; branches stocky, shaggy, grayish-brown. Leaves 3½ inches long, 1⅞ inches wide, leathery; apex abruptly pointed; margin very finely serrate; petiole 1½ inches long, slender. Flowers early, showy, 1⅝ inches across, in dense clusters, average 8 buds in a cluster. Fruit matures in early September; large, 3 inches long, 2¾ inches wide, uniform, obtuse-obovate-pyriform, symmetrical; stem 1 inch long, very thick; cavity obtuse, shallow, broad, often russeted, furrowed, lipped; calyx large, open; lobes separated at the base, broad, acute; basin shallow, wide, obtuse, gently furrowed and wrinkled; skin thin, tender, smooth except for the russet nettings; color pale yellow, occasionally with a mottled pinkish-red blush, more or less netted with russet; dots numerous, small, russet, conspicuous; flesh white, tender and melting, buttery, very juicy, briskly acid; quality good; core large, closed, axile, with meeting core-lines; calyx-tube very short, wide, broadly conical; seeds black, narrow, long, flattened, often abortive.

DOYENNÉ DU COMICE. Fig. 81. *Comice.* This pear has been esteemed long and justly for the beauty and high quality of its fruits, and, if its tree-characters were better, the variety would take high place in commercial orcharding as well as for the home orchard to which it is now almost wholly confined. The fruits are very large, smooth, except for russet markings, clear handsome yellow, sometimes brightened by a delicate blush, with yellow, fine-grained flesh, which is tender, melting, very juicy, sweet, piquant, perfumed. The quality is so good that the fruits of this variety are called by many the best of all pears. The list of faults for the trees is as long as the list of merits for the fruits. The trees make a poor growth in the nursery; must be humored in soil, climate, and care; they are subject to blight; while usually productive, they are not always so; lastly, they are a little below the average in hardihood to cold. The variety thrives on the Pacific slope where it is a valuable commercial pear. The parent tree of Doyenné du Comice was taken from the first seed-bed made in the fruit-garden of the Comice Horticole, Angers, France.

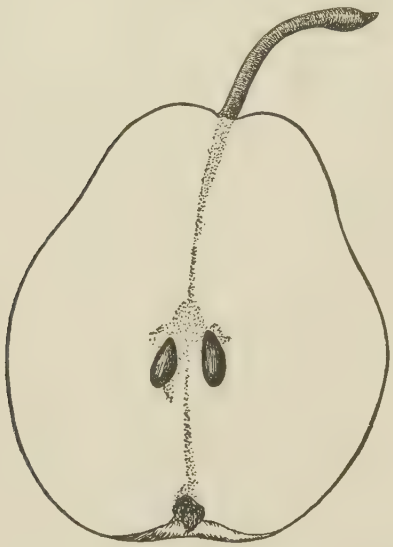


81. Doyenné du Comice. (×½)

Tree vigorous, characteristically upright, dense, usually productive; branches smooth, marked with large lenticels. Leaves 3¼ inches long, 1½ inches wide, oval, leathery; margin finely serrate; petiole 2 inches long. Blossoms open late; flowers 1¼ inches across, in dense clusters, about 8 buds in a cluster. Fruit ripe in late October and November; large, 3 inches long, 2¾ inches wide, obovate-obtuse-pyriform, with unequal sides; stem 1¼ inches long, very thick, curved; cavity obtuse, shallow, narrow, russeted and wrinkled, often with a fleshy ring around the base of the stem; calyx open; lobes separated at the base, long, narrow, acuminate; basin wide, obtuse, furrowed; skin tough and granular, smooth except for the russet markings, dull; color clear yellow, often with a faint russet-red blush on the exposed cheek, the surface heavily covered with large patches and nettings of russet; dots many, small, dark brown; flesh yellow, fine-grained near the outside but granular toward the core, melting, tender, buttery, very juicy, sweet and vinous, aromatic; quality very good to best; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, rather plump, acute, often abortive.

DROUARD: See Président Drouard.

DUCHESSE D'ANGOULÊME. Fig. 82. *Angoulême.* The fruits of Duchesse d'Angoulême excite admiration and wonder by their enormous size. They may always be known by their size, squat pyriform shape, and uneven knobby surface. Well grown, the flesh is buttery and melting with a rich and delicious flavor; but poorly grown, and on unfavorable



82. Duchesse d'Angoulême. (×½)

soils, the flesh is granular, coarse-grained, but half-melting, and nearly devoid of the richness that characterizes the fruits in happier situations. The trees are vigorous, hardy and healthy, bear abundantly under favorable conditions, and succeed either as standards or dwarfs. Possibly this sort is best grown as a dwarf, and in America at least is more often worked on the dwarfing quince than on the pear. This variety is the favorite dwarf pear for garden and home orchard, and commercial orchards of dwarfed trees are not uncommon. On either stock, the tree makes a beautiful and symmetrical pyramid, and comes in bearing early and bears regularly. This variety is more popular in New York than in any other part of America, and while less planted than formerly, is still regarded as a standard late autumn variety. The original tree of Duchesse d'Angoulême was a wilding growing in a garden near Angers, France. It was introduced about 1812.

Tree vigorous, upright, becoming spreading, dense-topped, slow-growing, productive; branches stocky, shaggy, zigzag, dull reddish-brown, marked with small lenticels. Leaves 2¾ inches long, 1⅝ inches wide, oval, thick, leathery; apex taper-pointed; margin marked with minute dark brown glands, crenate, or nearly entire; petiole 1¾ inches long. Flowers 1⅜ inches across, 7 or 8 buds in each cluster. Fruit ripe October-November; large, often very large, 3¾ inches long, 2¼ inches wide, uniform in size, oblong-obovate-pyriform with irregular and uneven surface and with sides often unequal; stem 1½ inches long, very thick, curved; cavity acute, deep, furrowed, irregular, often lipped; calyx partly open, small; lobes short, narrow, acute; basin medium to deep, abrupt, furrowed and uneven, often corrugated; skin thick, granular, roughened with russet; color dull yellow, streaked, spotted and netted with dull russet; dots numerous, russet, conspicuous; flesh white, firm, melting, tender, granular, juicy, sweet, rich and delicious; quality good to very good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds small, narrow, flat, acute, often abortive.

DUCHESSE D'ORLÉANS. *Saint-Nicolas.* While in no way remarkable, this variety is too valuable to be discarded. The pears are bright yellow with a brilliant cheek, the whole fruit being more or less mottled with golden russet; smooth of skin; symmetrical in shape; and the fruits are more uniform in size than those of most varieties. While the flesh is a little dry and not as rich in flavor as that of most other varieties of its season, it is so crisp and refreshingly piquant in contrast to the sweeter, buttery pears with which it ripens, that the variety finds favor with all who like pears. The variety fails in its tree-characters. The trees are late in coming in bearing; not very vigorous; somewhat tender to cold; and do not resist blight well. The variety is well worth planting in the home orchard. This pear is a chance seedling found by M. Maurier near Angers, France.

Tree medium in size and vigor, spreading, rapid-growing, moderately productive; branches medium in thickness and smoothness, reddish-brown, with few indistinct lenticels. Leaves 3 inches long, 1½ inches wide; apex taper-pointed; margin tipped with small brownish glands, coarsely serrate; petiole 2 inches long, glabrous, reddish-green. Flowers showy, 1⅜ inches across, in dense clusters, average 7 buds in a cluster, the petals widely separated at the base. Fruit matures in late September and October; medium in size, 2⅞ inches long, 2¼ inches wide, obovate-acute-pyriform, symmetrical; stem 1 inch long, thick; cavity lacking, the flesh drawn up in a symmetrical fold about the stem; calyx small, open; lobes separated at the base, narrow, acute; basin very shallow, narrow, obtuse, smooth or slightly wrinkled; skin thin, tender, smooth; color yellow overlaid with a pinkish-red blush, faintly mottled with golden russet; dots numerous, whitish or russet, conspicuous; flesh tinged with yellow, firm, granular, crisp, juicy, subacid; quality good; core small, closed, axile, with meeting core-lines; calyx-tube short, conical; seeds long, plump, acute.

DUHAMEL DU MONCEAU. *Duhamel.* The unattractive little fruits of this pear would have small value were it not for the fact that they are delicious in quality, and come into edible condition about the latest of all pears. The fruits are similar to those of Winter Nelis, differing in shape somewhat, but are even better in quality and keep longer. They are distinguished by a musky taste and perfume, which is especially agreeable to those who like rich, sweet, perfumed pears. The trees are better than most of their orchard associates, and far superior to the unmanageable Winter Nelis with which this variety must compete. After a probationary period of a half century in America, Duhamel du Monceau has not found favor with commercial orchardists, but pear fanciers value it for its delectable late-keeping fruits. Duhamel du Monceau was obtained from seed by André Leroy, Angers, France.

Tree vigorous, upright, dense, slow-growing, hardy; branches thick, zigzag, dull brownish-red, marked with numerous, large lenticels. Leaves 3 inches long, 1⅞ inches wide, long, folded lengthwise with the margins curled under, leathery; apex taper-pointed; margin entire or very coarsely crenate; petiole 2 inches long, slender. Blossoms open late, 1 inch across, well distributed, averaging 7 buds in a cluster. Fruit ripe October-November; 3⅛ inches long, 2½ inches wide, roundish-pyriform or at times oblong-pyriform, symmetrical, with equal sides; stem 1 inch long, curved, thick; cavity lacking, the stem being attached to the smooth, flat surface; calyx open; lobes separated at the base, short, obtuse or acute; basin shallow, obtuse, gently furrowed, small; skin thin, tender, roughened by the russet skin, dull; color greenish-yellow nearly overspread with solid, russet or at times only splashed, spotted and sprinkled with russet; dots many, small, russet, obscure, slightly raised; flesh yellowish-white, granular around the core, melting, buttery, very juicy, vinous; quality very good; core variable in size, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds elongated-oval, wide, plump, acute.

EARLY HARVEST. *Chambers.* The fruits of Early Harvest are so poor in quality, and rot at the core so soon after ripening, that the variety is hardly worth growing. To offset these defects, the pears are large and handsome for early fruits, and the trees are healthy, regular, and heavy bearers. The pear is characterized by a thick, fleshy stem and a large, closed core. Nurserymen report that the tree is difficult to propagate, and fruit-growers find that it is slow in coming in bearing; the growth is usually straggling and difficult to manage in nursery or orchard. The variety is more popular in the Middle West than in any other part of the country. This variety appears to have been brought to Middletown, Kentucky, from Maryland by Captain William Chambers about 1800.

Tree large, very vigorous, upright-spreading, dense-topped, very hardy, productive, long-lived; trunk very stocky, shaggy; branches thick, shaggy, zigzag, dull reddish-brown mingled with green and heavily marked with numerous large, elongated lenticels. Leaves 3⅛ inches long, 2⅜ inches wide; apex very abruptly pointed; margin glandless, varying from finely serrate to entire; petiole 1⅝ inches long, slender. Flowers open early, showy, 1⅛ inches across, well distributed, average 7 buds in a cluster. Fruit ripens in August; large, obovate-obtuse-pyriform, symmetrical; stem very thick, fleshy at its juncture with the cavity; cavity obtuse, shallow, narrow, often wrinkled and drawn up in fleshy folds about the base of the stem, calyx small, open; lobes short, obtuse; basin shallow, narrow, obtuse, wrinkled; skin thin, smooth; color pale yellow, more or less overspread on the cheek with a pinkish blush, occasionally mingled with stripes of carmine; dots numerous, small, greenish-russet, obscure; flesh yellowish, firm, granular, crisp, somewhat tough, variable in juiciness; quality poor; core large, closed, axile, with clasping core-lines; calyx-tube very long, narrow; seeds wide, short, plump, obtuse.

EASTER BEURRÉ. *Doyenné d'Hiver.* The fruit-books of Europe have so much to say in praise of Easter Beurré that the variety has been tried time and again in America, but nearly always with unfavorable results. It grows well only in warm climates and on light, warm soils, and refuses to ripen its crop on any others. There are occasional places in eastern America where Easter Beurré can be well grown, but for most part it is at home only on the Pacific slope. The fruits are of first rate excellence when at their best, and add much to the winter supply of pears. They are excellent shippers and keep well in common or cold storage, so that where the variety succeeds it is valuable for home, distant and foreign markets. The trees are in every way satisfactory except that they bloom earlier than other sorts, and are susceptible to the scab-fungus in both fruit and foliage; they are hardy, vigorous, and productive. Easter Beurré originated at a monastery in Louvain, Belgium, about 1823.

Tree vigorous, upright-spreading, open-topped, slow-growing, hardy, variable in yield; trunk and branches medium in thickness and smoothness; branches reddish-brown sprinkled with inconspicuous lenticels. Leaves 2⅛ inches long, 1⅛ inches wide, thin; apex abruptly pointed; margin finely serrate, the teeth very short, tipped with red; petiole 2 inches long, slender. Flowers 1¼ inches across, occasionally tinged with pink in the bud, average 9 buds in a cluster. Fruit in season late December to February; 3 inches long, 2⅜ inches wide, obovate-pyriform, with a short, thick neck; stem ¾ inch long, thick, woody; cavity acute, very deep, narrow, furrowed, uneven, compressed; calyx open; lobes narrow, acute; basin deep, narrow, abrupt, furrowed and wrinkled; skin thick, tough, roughened by the dots, the surface uneven; color yellow, marked with many russet dots and with a few patches and veinings of russet and often with a dull brownish-red blush; dots numerous, small, very conspicuous, russet; flesh tinged with yellow, quite granular especially near the center and toward the calyx, tender and melting, juicy, buttery, sweet, with a rich, pleasant flavor which is neither vinous nor sprightly, very aromatic; quality very good; core large, closed, axile, with meeting core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute.

ELIZABETH. *Manning's Elizabeth.* Elizabeth is among the best summer pears for eastern America, either for home consumption or for the markets. The characters which commend it are: handsome, well-flavored fruits; and vigorous, hardy, productive trees, which are as resistant to blight as those of any other European pear, and which come in bearing early and bear annually. Faults are: the fruits are small; they are a little coarse in texture of flesh, which is a little too gritty; and the flavor, while good for an early pear, is not sweet and rich. The trees are nearly flawless, failing, if at all, in not attaining sufficient size. The crop is often borne in clusters—a defect by reason of which the fruits are often small. But even with these faults, this is one of the best of summer pears. Elizabeth is a Belgian pear which originated with Van Mons early in the nineteenth century.

Tree small, upright, dense-topped, hardy, very productive; trunk slender; branches brownish-green, marked by conspicuous, oval lenticels. Leaves 3 inches long, 1½ inches wide, stiff; apex variable; margin almost entire; petiole 2 inches long, slender, reddish-green; stipules very small and slender when present. Flowers early, showy, 1⅝ inches across, in dense clusters, average 8 buds in a cluster. Fruit ripe in late August; inferior in size, 2⅜ inches long, 2½ inches wide, obovate-obtuse-pyriform, symmetrical, uniform; stem 1 inch long, thick, curved; cavity acuminate, shallow, narrow, symmetrical, often lipped; calyx large, almost closed; lobes separated at the base, short, narrow, acuminate; basin shallow, obtuse, gently furrowed and wrinkled; skin tough, characteristically rough, glossy; color bright yellow with a beautiful, lively, pinkish-red cheek, mottled, mingled with brownish, minute specks; dots numerous, very small, conspicuous, russet or brown; flesh tinged with yellow, slightly granular under the skin, strongly granular at the center, tender and melting, very juicy, sweet, vinous, aromatic; quality very good; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds wide, plump, acute.

FLEMISH BEAUTY. Fig. 83. At one time Flemish Beauty was a leading commercial variety in the pear regions of eastern America, but it has been supplanted by other varieties because the toll of blighted trees is too great, and the fruits are too often disfigured by the scab-fungus. Perhaps the latter is the greater fault, as in some seasons no applications of spray

83. Flemish Beauty. (×½)

give the pears a clean cheek, and they are blackened, scabbed, cracked and malformed with fungus. Not infrequently the scab-infected foliage drops before the crop matures. To offset these defects, the trees are unusually fruitful, and as hardy as those of any other variety. The fruits are nearly perfect if scab-free, and properly matured. The pears must be picked as soon as they attain full size and be permitted to ripen under cover. So treated, a bright-cheeked Flemish Beauty is as handsome as any pear, and is almost unapproachable in quality, the flavor being nicely balanced between sweetness and sourness, very rich, and has a distinct muskiness that all like. Blight and scab condemn tree and fruit for commercial orchards, but a lover of pears should combat these troubles for the sake of the choice fruits. The parent tree of this variety was a wilding found in a wood near Alost, Belgium, about the beginning of the nineteenth century.

Tree medium in size, vigorous, spreading, often with drooping branches, rapid-growing, hardy, productive; trunk smooth; branches thick, shaggy, bright reddish-brown, with large lenticels. Leaves 3½ inches long, 1¾ inches wide, oval, thick, leathery; apex taper-pointed; margin finely serrate; petiole 2 inches long, usually slender. Flowers 1¼ inches across, in dense clusters, usually 7 buds in a cluster. Fruit ripe late September and early October; large, nearly 2¾ inches long, 2½ inches wide, uniform in size and shape, obovate-obtuse-pyriform, symmetrical, with nearly equal sides; stem 1⅛ inches long, thick; cavity acute, shallow yet much deeper than in the average pear, narrow, slightly russeted, a little furrowed; calyx open; lobes partly separated at the base, short, obtuse; basin shallow, narrow, abrupt, symmetrical; skin thick, tough, roughish, dull; color clear yellow, overspread on the exposed cheek with a dotted and marbled, reddish blush; dots numerous, russet, small, conspicuous; flesh yellowish-white, firm, becoming melting and tender, granular, juicy, sweet, aromatic, with a slight musky flavor; quality very good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds rather long, plump, acute.

FONDANTE DE NOËL. *Belle de Noël.* The fruit of this rare European pear is distinguished by its trim top shape and russeted coat, which is usually enlivened with a dull, ruddy color on the sunny side. The flesh, while gritty near the core, is tender, juicy, buttery, very rich, sweet and aromatic. It is just the pear for those who prefer sweetness to vinousness, and who object to even a trace of astringency. The trees, while only medium in size, are vigorous, hardy, healthy and productive. The fruits are in season and at their best for Christmas. This pear was raised from seed by Major Espéren, Mechlin, Belgium. The tree fruited first in 1842.

Tree medium in size and vigor, upright, hardy, productive; trunk thick, smooth; branches brownish-green. Leaves 3½ inches long, 1½ inches wide; apex taper-pointed; margin glandless, finely serrate; petiole 2⅞ inches long. Flowers showy, 1½ inches across, white often tinged pink on the edges of petals, average 9 buds in a cluster. Fruit matures December-January; above medium in size, 2½ inches long, 2¾ inches wide, roundish-turbinate, irregular; stem ¾ inch long, thick, woody, obliquely set; cavity obtuse, shallow, narrow, furrowed, often lipped; calyx small, nearly closed; basin narrow, obtuse, furrowed; skin roughened by russet dots and patches; color dull greenish-yellow, with many dots, flecks and patches of russet, often with a faint trace of brownish-red on the sunny side; dots numerous, small, russet, rather conspicuous; flesh white, gritty only near the core, tender, buttery, juicy, sweet, highly aromatic; quality good to very good; core large, with meeting core-lines; calyx-tube short, wide; seeds large, long, plump, acute.

FORELLE. *Trout Pear.* The fruits of Forelle satisfy the eye for bright colors, and are distinguished by trout-like specklings from which comes "Forelle," the German name for trout. Looks belie taste, however, for while the flesh is delicate and buttery, it is not highly flavored and disappoints those who regard high quality a prime requisite in a pear. The trees are very satisfactory in warm soils and exposure, but fail in heavy clays and cold climates. The variety is worth growing for its beautiful and distinctive fruits. The variety originated in northern Saxony at the beginning of the eighteenth century.

Tree medium in size, vigorous, upright, very hardy and very productive; branches few, dark brownish-red, sprinkled with numerous lenticels. Leaves small, flat, round-ovate. Flowers open early. Fruit ripens November-December; medium in size, 3 inches long, 2 inches wide, oblong-obovate-pyriform, with a neck variable in length; stem 1 inch long, slender; cavity shallow, oblique, narrow, often lipped; calyx small, open; lobes broad; basin shallow, narrow, abrupt; skin smooth; color yellow, more or less overlaid with pinkish-red, deepening to rich crimson next to the sun, profusely covered with grayish-russet dots which are margined or rayed with crimson; dots numerous, large and small, russet or grayish; flesh white, fine-grained, granular at the center, melting, buttery, juicy, aromatic, with a rich, vinous flavor; quality good; core medium in size; seeds nearly black, of medium size.

FOX. Fox seems to have failed in the pear-growing regions of America, in spite of its having some excellent characters in both

fruit and tree. The fruits are not quite attractive enough to sell on the markets or to grace the table of the amateur, their rough, russet skins detracting greatly from their appearance. When the skin is removed, however, a better late fall pear cannot be found. The flesh is white, fine in texture, very juicy, melting, and has a brisk, vinous flavor and a pleasant aromatic smell and taste that at once place the quality very high. The trees are but mediocre in the prime characters of a good orchard plant. The variety is condemned for any purpose other than the collector's plantation. Fox is one of many seedlings originated by B. S. Fox, San José, California, about 1870.

Tree upright-spreading, round-topped, moderately productive; trunk slender; branches stocky, smooth, greenish-brown. Leaves 2⅛ inches long, 1¼ inches wide, thick; apex abruptly pointed; margin nearly entire to finely serrate. Flowers open early. Fruit ripe October-November; large, 3⅛ inches long, 2⅛ inches wide, oblong-obovate-pyriform; stem 1½ inches long, very thick, curved, obliquely set; cavity very shallow or lacking, the flesh folded up around the base of the stem; calyx closed or slightly open, variable in size; lobes much separated at the base, short, broad, acute; basin shallow, narrow, very small, furrowed and compressed; skin thick, granular, tough, roughened by the russet dots; color russet-yellow, often with a russet-red blush on the side next to the sun, overspread with russet; dots numerous, conspicuous, russet; flesh white, granular near the core, melting, very juicy, sweet, mingled with a brisk vinous flavor, richly aromatic; quality very good; core large, closed; calyx-tube short, wide; seeds wide, plump, acute.

FREDERICK CLAPP. Frederick Clapp has a place on the pear list, because it is one of the few good varieties with acidulous fruits. The refreshing, piquant flavor; the tender, melting, juicy flesh; and the bright lemon-yellow color without a trace of red give sufficient charm and character to the fruits to make the variety desirable in every collection of good pears. The trees are vigorous and healthy and form open, wide-spreading heads that commend them for orchard management. They grow with rapidity and vigor, come in bearing early, and are unusually fruitful. The variety is seldom planted in commercial orchards, but it has a welcome place in every home orchard fortunate enough to have it. This pear was raised about 1870, by Lemuel Clapp, Dorchester, Massachusetts.

Tree large, vigorous, upright becoming very spreading, with open top, hardy; trunk thick, shaggy; branches stocky, shaggy, zigzag, dull reddish-brown, marked with many small lenticels. Leaves 3 inches long, 1¾ inches wide, ovate, stiff; apex taper-pointed; margin tipped with very fine, sharp-pointed, reddish-brown glands, finely serrate; petiole 1½ inches long, slender, glabrous. Flowers cup-shaped, often with a disagreeable odor, 1 inch wide, averaging 9 buds in a cluster. Fruit ripe in October; medium in size, more than 2 inches long, 2⅜ inches wide, variable in size; roundish or obovate, irregular in shape, stem ¾ inch long, thick; cavity variable, often with a fleshy fold drawn up around the base of the stem; calyx open; lobes short, broad, obtuse; basin deep, wide, abrupt, usually smooth, symmetrical; skin thin, tender, smooth; color lemon-yellow, often marked with flecks and mottlings of russet; dots numerous, small, russet, obscure; flesh with a tinge of yellow, fine, tender, melting, characteristically juicy, sweet, with a rich sprightliness; quality very good; core closed, axile, with clasping core-lines; calyx-tube very short, wide, broadly conical; carpels obovate; seeds large, wide, long, plump, acute.

GANSEL SECKEL. There are no good reasons why this pear should be grown, it having received much more attention than it deserves during the half century it has been in America. It suffices to say that the fruits and trees are in no way equal to those of Seckel. While the pears are larger than those of Seckel, the yield is not as great, as the trees do not bear as regularly, nor as abundantly; the crop ripens a little later. The fruits are not as well flavored, nor as attractively colored. The variety is still offered by many nurserymen, most of whom, however, condemn it with faint praise. Gansel Seckel was raised from seed a century ago by a Mr. Williams, Worcester, England.

Tree upright-spreading, variable in yield; branches slender, zigzag, sprinkled with numerous lenticels. Leaves 2¼ inches long, 1½ inches wide; apex taper-pointed; margin tipped with few reddish glands, coarsely serrate; petiole 1¼ inches long. Flowers open early, 1¼ inches across. Fruit ripens in late October and November; small to medium, irregular, oblate-pyriform; stem ¾ inch long, stout; cavity variable in width, shallow, irregular; calyx small, closed; lobes erect, acute; basin variable in width, deep; skin roughened with russet, uneven; color pale yellow, largely overspread with thin cinnamon-russet, sometimes faintly blushed on the exposed cheek; dots distinct, cinnamon-russet; flesh yellowish-white, coarse, melting, buttery, juicy, highly aromatic, with a rich perfume, sweet; quality very good.

GARBER. *Garber's Hybrid.* A few trivial differences separate Garber from Kieffer. The pears ripen a week or two earlier than those of Kieffer, are a little rounder, flatter at the ends, and some say are a little better in quality—certainly they are no worse to eat out of hand. The tree is hardy to heat and cold, and is much planted in the Mississippi Valley, North and South. The variety might be sparingly planted as an ornamental. Garber is one of many seedlings of the Chinese Sand pear, raised by J. B. Garber, Columbia, Pennsylvania.

Tree vigorous, upright-spreading, hardy, productive with age; branches smooth, zigzag, reddish-brown. Leaves 3½ inches long, 2¼ inches wide, thick; apex taper-pointed; margin with very minute and reddish tips, finely serrate; petiole 2¼ inches long, thick. Fruit ripe September-October; large, usually roundish-oblong and tapering toward both ends; stem 1 inch long, stout, obliquely set; cavity small, narrow, often deep and furrowed; calyx variable in size, partly open; lobes slender; basin broad, abrupt, deep, furrowed; color pale yellow, often with a brownish-red blush on the exposed cheek; dots small, numerous, russet; flesh white, granular, crisp but tender, juicy, neither sweet nor sour but with a peculiar pleasant flavor; quality inferior.

GIFFORD: See Beurré Gifford.

GLOU MORCEAU. This old winter pear is nearly lost to cultivation, but is worth growing because of the high quality of the fruit, and because the pears come in season in early winter when there are few others. The fruits are not attractively colored, but are rich and sugary without the least trace of acid, though when poorly grown are often astringent. The quality is better in fruits from dwarf trees, and is better, also, when grown on heavy soils than on light ones. The fruits keep and ship remarkably well. The trees are

neither very large nor vigorous, but are usually productive. The variety is in disrepute in many localities because the crop does not always ripen well. M. Hardenpont, a pioneer pear-breeder, raised this pear from seed about 1750 at Mons, Belgium.

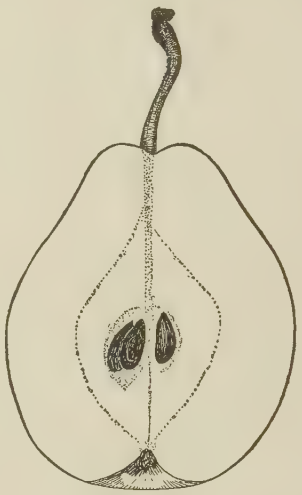
Tree vigorous, spreading, dense-topped, rapid-growing, productive; trunk stocky; branches thick, reddish-brown, marked with numerous, large lenticels. Leaves 2¾ inches long, 1¾ inches wide, thick, leathery; apex taper-pointed; margin occasionally with very few, small glands, coarsely or finely serrate; petiole 2 inches long, thick, glabrous, greenish. Flowers late, showy, 1¼ inches across, in dense clusters, 8 to 11 buds in a cluster. Fruit matures November-December; large, 3⅛ inches long, 2¾ inches wide, obovate-obtuse-pyriform, irregular, sides unequal, somewhat ribbed; stem ⅞ inch long, thick and woody, curved; cavity deep, narrow, russeted, deeply furrowed, compressed, lipped; calyx open; lobes long, narrow, acute; basin deep, smooth, broadly furrowed; skin tender, very gritty, dull, roughened by russet; color pale greenish-yellow, with patches and mottlings of light russet; dots numerous, small, conspicuous, light russet; flesh tinged with yellow, fine-grained except near the core and under the skin, tender, buttery, sweet, with a rich, pleasant, aromatic flavor, mingled with astringency near the skin; quality good to very good; core closed, axile, with clasping core-lines; calyx-tube short, broad, conical; seeds large, wide, long, plump, acute.

GUYOT. *Doctor Jules Guyot.* The fruits of Guyot bear strong resemblance to those of Bartlett, but differ in being larger, rather more handsomely colored, ripen a little earlier, have coarser flesh, and are very differently flavored. The product can seldom compete with that of Bartlett, or even with that of Clapp Favorite with which it ripens, because its season is exceedingly transitory. Unless picked quite green and ripened indoors, the pears rot at the center, and even when ripened under the best conditions quickly become mealy and insipid. Taken at the proper moment, the pears are better flavored than those of Bartlett; they are richer and have a more delicate taste and perfume than the musky fruits of Bartlett. The trees are quite as satisfactory as those of Bartlett, unless, possibly, they fall short somewhat in productiveness. The variety is well worth planting in collections for its early, handsome, well-flavored fruits. Guyot was raised in the nurseries of the Baltet Brothers, Troyes, France, about 1870.

Tree medium in size, vigorous, upright, hardy, productive, a regular bearer; trunk and branches brownish, marked by roundish, small, indistinct lenticels. Leaves 2⅞ inches long, 1¾ inches wide; apex taper-pointed; margin glandular, variable in serration; petiole 2 inches long, thick, reddish-green. Flowers open late, showy, 1¼ inches across, in dense clusters, from 5 to 8 buds in a cluster. Fruit ripens in early September; very large, 3¼ inches long, 2⅝ inches wide, oblong-obtuse-pyriform, irregular, with unequal sides; stem 1¼ inches long, thick, curved; cavity obtuse, shallow, narrow, slightly russeted, drawn up on one side of the stem in a prominent lip; calyx large, open; lobes separated at the base, short, broad, acute; basin shallow, narrow, obtuse, furrowed; skin very thin, tender, roughish; color yellow, more or less mottled and with traces of russet, with a pinkish-red blush on the exposed cheek; dots numerous, small, russet, conspicuous; flesh yellowish-white, granular, tender, moderately juicy, sweet mingled with sprightliness; quality good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, long, plump, acute.

HARDY. See Beurré Hardy.

HOWELL. Fig. 84. *Howell's Seedling.* Howell is everywhere condemned with faint praise. After having said that the trees are not above the average in vigor, healthfulness, hardiness, and fruitfulness, it remains only to



84. Howell. (×½)

be said that their spreading tops make them desirable orchard inhabitants and handsome dooryard ornamentals. The fruits cannot be praised for attractive appearance or good quality, but they are meritorious in that they are more often uniform in appearance, quality, and freedom from the ravages of the scab fungus than those of almost any other pear. These qualities make Howell an estimable variety for the home orchard where intensive care cannot be given. The trees bear early, annually, and abundantly. Howell seems to be better suited to the middle western states than to the eastern states. About 1830, Thomas Howell, New Haven, Connecticut, planted pear seeds in his garden; one of the trees resulting from these seeds was named Howell.

Tree large, vigorous, spreading, open-topped; trunk thick; branches stocky, reddish-brown, with few small lenticels. Leaves 2 inches long, 1⅛ inches wide, oval, leathery; apex taper-pointed; margin finely serrate, hairy, tipped with very minute glands; petiole 1½ inches long. Flowers open early, 1⅜ inches across, in dense clusters, from 7 to 15 buds in a cluster. Fruit ripe in late September-October; medium in size, 2⅜ inches long, 2¼ inches wide, uniform in size and shape, round-obovate, symmetrical; stem 1 inch long, thick, straight; cavity obtuse, very shallow and narrow, often with almost no cavity, smooth, symmetrical; calyx open, small; lobes separated at the base, short, narrow, obtuse; basin obtuse, but slightly furrowed, nearly symmetrical; skin smooth, dull; color pale lemon-yellow marked on the side exposed to the sun with a trace of blush and with patches and tracings of russet; dots many, small, russet, very conspicuous; flesh yellowish-white, firm but tender, granular, melting, very juicy, sweet, with a rich, somewhat brisk, almost vinous flavor, aromatic; quality very good; core rather large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds long, plump, acute, frequently abortive.

IDAHO. There is much difference of opinion as to the value of Idaho. Without question, the variety is of considerable worth in parts of the Pacific Northwest, especially in regions where hardihood is a prime requisite. In the East, the pears are only medium in size, but they are attractive in color and of excellent taste. The core is small, and the seeds are often abortive and sometimes wanting. The flesh is tender, buttery and almost free from granulation, with a rich, sweet, vinous flavor which make the rating for this fruit "good to very good." In many regions, the pears are large, rough and gross—sometimes a facsimile of Duchesse d'Angoulême. The trees are rather dwarf and are fruitful to a fault, so that the pears often run small; they are hardier than those of almost any other pear and bear annually. To offset these good characters, the trees have the fault of blighting, so that the variety is of value only in regions where blight is not an annual scourge of this fruit. Idaho was raised from seed of an unknown variety about the year 1867 by a Mrs. Mulkey, Lewiston, Idaho.

Tree vigorous, upright-spreading, hardy, very productive; branches slender, smooth, reddish-brown, sprinkled with many small lenticels. Leaves 3¾ inches long, 1⅝ inches wide, leathery; apex abruptly pointed; margin glandular, finely serrate; petiole 2 inches long. Flowers showy, 1⅛ inches across, in dense clusters, nearly in racemes, average 8 buds in a cluster. Fruit matures late September-October; medium in size, 2 inches long, 2⅛ inches wide, roundish, slightly pyriform, symmetrical; stem 1 inch long, thick, slightly curved; cavity acute, narrow, furrowed, slightly lipped; calyx closed; lobes broad, acute; basin shallow, obtuse, somewhat furrowed; skin thick and granular, tough, roughish; color dull lemon-yellow, tinged with green, dotted and streaked with russet, splashed with russet patches; dots numerous, small, russet, conspicuous; flesh dull white, tinged with yellow, firm, tender, buttery, juicy, sweet, rich, almost vinous; quality good to very good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds wide, acute.

JARGONELLE. At one time the best second early pear, Jargonelle is now little grown in America, native varieties having crowded it out. The crop ripens two or three weeks before that of Bartlett. The fruits are as attractive as any of their season, and are unique in shape and in having a long curved stem. The quality leaves much to be desired. The flesh is coarse, rather gritty, and the flavor lacks the rich sugary taste on the one hand, or the refreshing piquancy on the other hand, of good pears. The fruits rot at the core, and the season is short. The crop should be picked early and ripened in the house. The trees are large, vigorous and sometimes very productive, but are coarse, untidy bearers, and are often uncertain in bearing. Jargonelle is one of the oldest of all varieties, according to some, dating back to before the time of Christ.

Tree large, vigorous, spreading, open-topped, rapid-growing, hardy, very productive, long-lived; trunk shaggy; branches reddish-brown, with large lenticels. Leaves 3¼ inches long, 2 inches wide, leathery; apex taper-pointed; margin tipped with few small, black glands, finely serrate; petiole 3 inches long, slender, tinged with red, glabrous. Flowers late, showy, 1½ inches across, in dense clusters, from 8 to 14 buds in a cluster. Fruit ripe in late August; above medium in size, 3 ⅜ inches long, 2 3/16 inches wide, oblong-ovate-pyriform, with an acute neck; stem characteristically long and curved, 1⅝ inches long; cavity lacking, the flesh holding up around the base of the stem, russeted, lipped; calyx open; lobes separated at the base, long, broad, acute; basin very shallow and narrow, obtuse, gently furrowed, compressed; skin smooth; color yellow, with a bright reddish-pink blush laid thinly over the exposed cheek in streaks and splashes, when poorly grown without blush; dots numerous, greenish-russet, very small, obscure; flesh yellowish-white, granular under the skin, gritty at the center, melting, very juicy, subacid, aromatic, vinous; quality very good; core large, open, with clasping core-lines; calyx-tube long, narrow, conical; seeds large, wide, long, plump, acute.

JOSÉPHINE DE MALINES. Fig. 85. *Malines.* This is one of the few good winter pears. Its fruit-characters are so distinctive and meritorious that the variety should be grown in every home orchard. The fruits have a marked peculiarity; cut through the shaded yellow-russet skin, flesh with a faint, rosy tint is displayed. But it is the quality of the fruits that commends the variety most. The flesh is buttery, juicy, sweet, and perfumed—pleasing in every character that gratifies the palate. The season is exceedingly variable, being given variously by pomologists from December to March and January to May. In the orchard, the trees are satisfactory, but nurserymen find them difficult to grow; this, no doubt, is the chief reason for the neglect of this excellent pear. The trees thrive in almost any soil or situation suitable to pears, and are fruitful, hardy, and resistant to blight. The variety deserves wider recognition than it now receives. This pear originated about 1830 in the seed-beds of Major Espéren, the well-known pomologist of Mechlin, Belgium.

85. Josephine de Malines. (×½)

Tree large, vigorous, spreading, tall, dense-topped, rapid-growing, hardy, very productive; trunk stocky; branches thick, shaggy, reddish-brown, marked with few lenticels. Leaves 2¼ inches long, 1¼ inches wide, leathery; apex taper-pointed; margin finely serrate; petiole 1¾ inches long. Flowers early, 1⅜ inches across, white, occasionally tinged with pink, well distributed, average 7 buds in a cluster. Fruit ripe December-February; medium in size, turbinate, inclined to truncate; stem long, very thick; cavity obtuse, shallow, narrow, slightly furrowed; calyx large, open; lobes short, broad, obtuse; basin narrow, obtuse, smooth; skin thick, tough, dull; color pale greenish-yellow, netted and patched more or less with russet; dots numerous, small, brown or russet, conspicuous; flesh pinkish-white, firm, granular, melting, buttery, very juicy, sweet, slightly aromatic; quality good; core large, closed, axile, with clasping core-lines; calyx-tube short, wide; carpels pyriform; seeds large, wide, long, plump, acuminate.

KIEFFER. Fig. 86. Although the most pretentious cheat in the orchard, Kieffer is grown more commonly than any other pear in North America excepting Bartlett. Its great popularity can be accounted for only by accepting Barnum's dictum that "Americans love

to be fooled." There are several reasons why Kieffer is widely planted. No pear has been advertised so widely and so unqualifiedly, growers of trees often supplying virtues to the variety which Nature denies it. Nurserymen like it because of all pears the trees of Kieffer are most easily grown; and in the orchard they are uniformly the most vigorous, fruitful, endure heat best, are least susceptible to blight, and

86. Kieffer. (×½)

withstand best the ravages of San José scale. On the other hand, the trees are tender to cold, in some soils refuse to set fruit, are often self-sterile, and sometimes with the best of care bear only pears of small size. Worthless for dessert, much can be said for the fruits of Kieffer for culinary preparation. Cooking removes the disagreeable natural taste of the raw pear, and leaves a good product. Canned, the pears retain their shape, color, and flavor well; therefore, and because of white and inviting flesh, Kieffers are preferred by commercial canners. Now that the first flush of popularity is past, it would seem a wise precaution on the part of pear-growers to grow this fruit chiefly for the cannery, supplying the demands for dessert pears with worthier varieties. Peter Kieffer, who lived near Philadelphia, grew Chinese Sand pears as ornamentals. In his garden there were also trees of Bartlett. Among chance seedlings, Kieffer observed one of peculiar growth which he saved. Probably it was a hybrid between the pears named. This bore fruit for the first time in 1863 and was the original Kieffer tree.

Tree of medium size, vigorous, upright, dense-topped, hardy, very productive; branches slender, nearly smooth, reddish-brown, marked with few small lenticels. Leaves 3¼ inches long, 1¾ inches wide, oval, thick, leathery; apex taper-pointed; margin often finely serrate; petiole 1⅞ inches long. Flowers open early, 1⅝ inches across, fairly well distributed, varying from 3 to 11 buds in a cluster. Fruit matures in late October and November; above medium to large, 2¾ inches long, 2¼ inches wide, oval, narrowing at both ends, symmetrical, uniform; stem 1 inch long, thick; cavity very small, smooth; calyx open; lobes separated at the base, short, narrow, acute; basin shallow, narrow, obtuse, nearly smooth; skin thick, tough, smooth; color yellow, occasionally blushed with dull pinkish-red on the exposed cheek; dots numerous, small, russet, conspicuous; flesh yellowish-white, very granular and coarse, crisp, juicy; not sweet, often astringent; quality poor; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds wide, plump, acute.

KINGSESSING. A summing up of the characters of Kingsessing makes it appear a most desirable sort. Nevertheless, its culture does not make headway. Growers rate it as a "good pear," but will not grow it, for the reason that it has no outstanding characters for any region, season or purpose. The pears are a little under size for a good commercial fruit, and while the sweet, perfumed flavor is pleasant it lacks individuality. The variety is grown chiefly along the Atlantic Coast from Long Island to Maryland. This is a natural seedling which sprang up in the family burial ground of Isaac Leech, Kingsessing, Pennsylvania, about 1833.

Tree very large and vigorous, upright-spreading, dense-topped, rapid-growing, hardy; trunk very thick; branches very stocky, grayish-brown, sprinkled with numerous large lenticels. Leaves 2¼ inches long, 1⅜ inches wide; apex abruptly pointed; margin glandular, finely serrate; petiole 1¾ inches long. Fruit ripens in September and October; medium in size, 2⅜ inches long, 2⅛ inches wide, obovate-obtuse-pyriform; stem ½ inch long, thick, usually curved, fleshy at the point of insertion in the flesh; cavity obtuse, shallow, slightly furrowed, occasionally lipped; calyx partly open; lobes separated at the base, short, narrow, acute; basin shallow, gently furrowed, usually symmetrical; skin granular, tender, roughish; color dull yellow, sprinkled and netted with russet, a thin brownish-red blush spreading over the exposed cheek; dots numerous, grayish or russet, small, conspicuous; flesh white, granular, tender and melting, sweet, aromatic; quality good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds wide, long, plump, acute.

KOONCE. Koonce is a popular early variety grown rather commonly in nearly every pear region in the United States. The trees make a good showing in the nursery and are hardy and productive in the orchard, although of but medium size and rather straggling at maturity. The pears are better in quality than those of Early Harvest or Lawson, with which it often competes, but are hardly as attractive in appearance, as they are small and often irregular in shape. The color is unusually bright, especially on the red cheek. The pears decay quickly after maturity and are suitable only for home and local markets. This pear originated in southern Illinois, but by whom or at what time does not appear. The variety has been grown for more than thirty years.

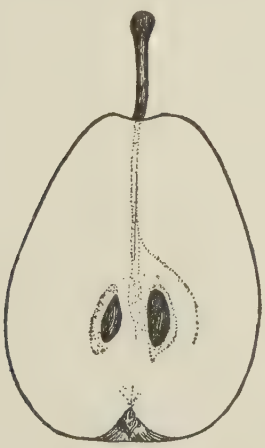
Tree upright-spreading, scraggly, open-topped, hardy, productive; trunk shaggy; branches zigzag, dark brownish-red, with few lenticels. Leaves 2½ inches long, 1½ inches wide, stiff; apex taper-pointed; margin glandular, finely serrate; petiole 1½ inches long. Flowers showy, 1¼ inches across, in dense clusters, average 5 buds in a cluster. Fruit ripens in August; medium in size, 2¼ inches long, 2⅜ inches wide, obovate-obtuse-pyriform, with unequal sides; stem 1¼ inches long, thick; cavity obtuse, shallow, narrow, compressed, lipped or often drawn up in a wrinkled fold about the base of the stem; calyx open; lobes separated at the base, narrow, acuminate; basin obtuse, gently furrowed; skin thick, tough, roughish; color pale

greenish-yellow with a dull reddish-brown blush spreading over the exposed cheek; dots numerous, very small, greenish-russet, conspicuous; flesh whitish, granular especially at the center, medium tender, juicy, aromatic, sweet but vinous; quality good; core small, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds small, narrow, short, plump, acute.

LAMY. This is an old European pear which had its probationary period in America many years ago, and which never got out of the limbo of nurserymen's catalogs and collections. On the grounds of the New York Agricultural Experiment Station, however, the pears are so handsome and so delectable in quality that the variety seems quite worth growing. It is a good sort for the home orchard, but the tree is not large enough nor robust enough for a commercial plantation. A few nurserymen still list it. This variety was raised from seed about 1828 by M. Bouvier, Jodoigne, Belgium.

Tree inferior in size, spreading, open-topped, hardy, productive; trunk slender, shaggy; branches slender, shaggy, dull brown, sprinkled with numerous lenticels. Leaves 2¾ inches long, 1¾ inches wide, leathery; apex taper-pointed; margin finely serrate, tipped with few minute glands; petiole 1⅞ inches long, pinkish. Flowers late, very showy, 1¾ inches across, in dense clusters, average 9 buds in a cluster. Fruit matures in late October and early November; 2½ inches long, 2 inches wide, obovate-obtuse-pyriform, often irregular and with unequal sides; stem 1⅛ inches long, thick; cavity almost lacking, very shallow, narrow, russeted, often lipped; calyx open; lobes broad, acute; basin deep, obtuse, gently furrowed, compressed; skin thin, smooth except for the russet dots, dull; color pale yellow, with a dark red blush on the cheek; dots numerous, large, brownish-russet, very conspicuous; flesh tinged with yellow, granular at the center, tender and melting, buttery, juicy, sweet, with a faint, vinous flavor, pleasantly aromatic; quality good to very good; core large, closed, with clasping core-lines; calyx-tube short, very wide, conical; seeds large, wide, plump, acute.

LAWRENCE. Fig. 87. There is a great diversity of opinion as to the value of Lawrence for a market pear, but no one denies it



87. Lawrence. (×½)

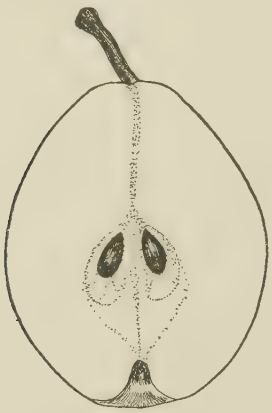
a place as one of the very best early winter pears for the home orchard. The tree is hardy, moderately vigorous and fruitful, an early, annual, and uniform bearer, and has the reputation of being one of the longest lived of all pear-trees. The fruits are of but medium size, but are trim in contour and distinctive in shape because of the rounded, truncate stem end; and in color are a bright clean lemon-yellow, marked with patches of russet and faintly blushed on the side to the sun. No yellow pear is more attractive. The fruits come in season in early winter and have the excellent character of keeping well under ordinary care for a full month or longer. The melting flesh abounds with a rich, sugary, perfumed juice, by virtue of which it is justly esteemed as the best flavored pear of its season. Lawrence is a chance seedling, a native of Flushing, Long Island, and was introduced in 1843.

Tree vigorous, spreading, with drooping branches, very hardy, productive; trunk shaggy; branches smooth, zigzag, reddish-brown, with numerous large lenticels. Leaves 2½ inches long, 1¼ inches wide, oval, leathery; margin finely serrate; petiole 1¾ inches long, slender; stipules rudimentary. Flowers open early, 1⅜ inches across, in rather dense clusters, from 8 to 12 buds in a cluster. Fruit ripe November-December; 2⅝ inches long, 2⅛ inches wide, uniform in size and shape, obovate-obtuse-pyriform, often with sides unequal; stem 1 inch long, thick, curved; cavity small, obtuse, shallow, narrow, russeted, furrowed and irregular, often lipped; calyx large, partly open; lobes separated at the base, long, broad, acute; basin wide, obtuse, furrowed and sometimes corrugated; skin thick and granular, tough, roughish; color lemon-yellow, marked with occasional patches of russet and with a faint russet-red blush on the exposed cheek; dots numerous, small, russet, inconspicuous; flesh yellowish-white, firm, granular, tender and melting when fully mature, juicy, rich, sweet; quality very good; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, long, plump, acute.

LAWSON. *Comet.* Of all early pears, the fruits of Lawson best satisfy the eye for bright colors. They are as brightly colored as the brilliant Vermont Beauty or as Mount Vernon. Another outstanding character is the small core, which, though the pears ripen early and quickly, seldom soften unduly. The pears are often nearly or quite seedless. Unfortunately, the fruits are often irregular in shape, and in quality are mediocre. The tree is fairly healthy, vigorous, hardy, and free from blight, and is characterized by its tall, upright growth. Although grown for more than a hundred years in the East, the variety has never made headway here, but seems to be attracting much attention on the Pacific slope. This pear originated on the farm of a Mr. Lawson, Ulster County, New York, about 1800.

Tree medium in size, vigorous, upright, dense-topped, not always hardy, very productive; branches slender, zigzag, reddish-brown, marked with numerous raised, large lenticels. Leaves 3¼ inches long, 1¾ inches wide; apex abruptly pointed; margin glandless, serrate; petiole 2 inches long. Flowers early, showy, 1½ inches across, in dense clusters, 6 or 8 buds in a cluster. Fruit ripens in August; large, 2¾ inches long, 3¼ inches wide, obovate-obtuse-pyriform, with unequal sides; stem ⅞ inch long, thick, curved, woody; cavity very small and narrow, often with a lip drawn up around one side of the stem; calyx partly open; lobes narrow, often reflexed; basin narrow, obtuse, gently furrowed; skin thin, tender, smooth; color pale yellow overspread on the exposed cheek with a bright, pinkish-red blush; dots numerous, small, greenish or russet, obscure; flesh whitish or often salmon-color, firm, tough, medium juicy, lacking sweetness; quality poor; core unusually small, closed, with clasping core-lines; calyx-tube short, wide; seeds short, wide, plump, obtuse, few in number.

LE CONTE. Fig. 88. Le Conte is a hybrid between the Chinese Sand pear and a European sort, therefore of the same parentage as Kieffer which it greatly resembles in both tree and fruit. The fruits are rather poorer in quality than those of Kieffer, if that be possible for an edible fruit, and the tree is in no way superior to that of its better-known rival, but seems to succeed better in warm climates and light soils. There is, therefore, a place for Le Conte in the South, if a pear is wanted for culinary purposes only. The fruits sometimes rot badly at the core, and should usually be harvested as soon as they attain full size. The trees are more susceptible to blight than those of Kieffer. In the South, the trees are often if not usually propagated from cuttings. Le Conte is supposed to have originated near Philadephia about 1850.



88. Le Conte. (×½)

Tree medium in size, vigorous, upright, slow-growing, very productive, a regular bearer; branches strongly zigzag, brownish-red mingled with green and nearly covered with scarf-skin. Leaves 3¼ inches long, 1½ inches wide, ovate or oval, leathery; apex taper-pointed; margin finely serrate; petiole pale green, glabrous. Flowers open very early, 1¼ inches across, in dense clusters, 7 to 10 buds in a cluster. Fruit ripe late October-November; large, 3 1/16 inches long, 2⅝ inches wide, round-oval, tapering at both ends, ribbed, symmetrical; stem 1⅛ inches long, very thick, often curved; cavity obtuse, very shallow and narrow, smooth, slightly furrowed and wrinkled, often compressed; calyx partly open; lobes usually dehiscent, separated at the base, short, narrow, acute; basin usually very deep, abrupt, gently furrowed; skin thick, tough, smooth or sometimes roughened, dull; color pale yellow, occasionally marked with russet; dots numerous, small, russet, conspicuous; flesh white, firm, rather granular and stringy, tender, juicy, sweet, with a strong and disagreeable flavor; quality poor; core very large, closed, axile, with meeting core-lines; calyx-tube short, wide, broadly conical; seeds large, average 2 in each carpel, wide, long, very plump, acute.

LE LECTIER. In size and beauty of fruit, Le Lectier surpasses most of its associates, and the quality is first rate in soils and climates to which the variety is suited. Unfortunately the tree is capricious to both soils and climates and is seldom at home on this side of the Atlantic. The season is December and January, when good pears are scarce, and it would seem that the fine, large fruits of this pear would be most acceptable for either home or market if it could be made to thrive. In Europe, it grows best on warm rich soils. Auguste Lesueur, Orléans, France, obtained this late winter pear about 1882 as a cross between Bartlett and Fortunée.

Tree medium in size, vigorous, upright, dense-topped, sometimes unsymmetrical, very productive; trunk and branches medium in thickness and smoothness. Leaves 2⅞ inches long, 1½ inches wide, thick; apex taper-pointed; margin glandular, finely serrate; petiole 2¼ inches long, slender. Flowers showy, 1½ inches across, 8 or 10 buds in a cluster. Fruit ripens December-January; large, elongated-obovate-pyriform, often with a narrow neck; stem slender, rather short, enlarged at both ends, inserted obliquely; cavity irregular, often lipped; calyx variable in size, partly open; basin variable in size, abrupt, irregular; skin glossy, thin, with uneven surface; color greenish-yellow becoming yellower at full maturity, mottled and faintly blushed on the exposed cheek with yellowish-bronze; dots inconspicuous, small; flesh white, fine-grained, melting, juicy, sweet, pleasantly aromatic; quality very good.

LÉON LECLERC. This variety is popular in Europe, but its reputation there is not sustained here, although it fills a particular niche in the pear season, the crop coming in season between late fall and early winter at a time when there are few other good varieties. Were it not for a serious fault, the variety might take high rank in America. After Flemish Beauty, no other variety suffers as much in fruit and foliage from scab. Well grown in a congenial environment, the pears are often as large as those of Duchesse d'Angoulême, with which they compare closely in shape. On well-grown specimens, also, the color is rich and beautiful. The flavor is sprightly and refreshing, which, with good flesh-characters, give the variety high rank for quality. There are no remarkable characters in the trees to recommend them. The variety is suitable only for collections. This pear originated with Léon Leclerc, Laval, France, about 1825.

Tree medium in size, vigorous, spreading, open-topped, slow-growing, productive; trunk shaggy; branches roughish, reddish-brown, with numerous large lenticels. Leaves 3¼ inches long, 1½ inches wide, leathery; apex taper-pointed; margin glandless, entire; petiole 1½ inches long, glabrous, reddish-green. Flowers showy, 1¼ inches across, in dense clusters, nearly a raceme, 7 or 8 buds in a cluster. Fruit ripens in late September and October; large, 2¼ inches long, 3⅜ inches wide, oblong-pyriform, tapering to a very long, narrow neck; stem 1 inch long, thick, curved; cavity very small, compressed, usually lipped; calyx large, open; lobes separated at the base, broad, acute; basin shallow, narrow, obtuse, symmetrical; skin thick, tough, roughened by russet specks; color dull yellow, covered with dots and tracings of russet and occasionally with a faint russet-red blush; dots numerous, small, russet, conspicuous; flesh granular under the skin, nearly melting, juicy, subacid or with a peculiar sprightliness; quality good; core large, closed, with clasping core-lines; calyx-tube short, narrow, conical; seeds large, wide, long, acute.

LINCOLN. Nearly a hundred years old without having received favorable mention from pear-growers, Lincoln has been brought from the limbo of lost fruits in recent years to take high rank in the list of pears for the Mississippi Valley. The variety is spoken of in such superlative terms for that region that

PLATE IV.—MONTMORENCY CHERRY.

it would seem that men give it attributes which Nature denies it. The fruits are but mediocre in appearance and quality, falling below a dozen other varieties of its season whether judged by the eye or the palate. At their best, they are comparable to those of Bartlett, which the western admirers of the variety say it resembles. Lincoln seems to possess a constitution to withstand cold, heat, and blight to which most pears are subject. The variety is valuable only in the Middle West. This pear owes its origin to a seedling grown in the spring of 1835 by Mrs. Maria Fleming, Corwin, Illinois.

Tree large, vigorous, upright-spreading, open-topped, rapid-growing, hardy, very productive; trunk stocky, smooth; branches medium in thickness and smoothness, zigzag, greenish-brown, marked especially on the younger wood with very numerous, large, roundish, conspicuous lenticels. Leaves 3½ inches long, 1½ inches wide, stiff; apex variable; margin glandless, finely serrate; petiole 2⅝ inches long, glabrous, tinged with red; stipules very long and slender, pinkish. Flowers 1⅜ inches across, well distributed, average 5 buds in a cluster. Fruit matures in late August and September; about 2¼ inches in length and width, roundish, with an obtuse neck, tapering very slightly; stem 1⅛ inches long, slender; cavity almost lacking, a slight, narrow depression, occasionally slightly lipped; calyx large, open; lobes separated at the base, long, acuminate; basin shallow, obtuse, smooth, symmetrical; skin thick, tender, rough; color dull greenish-yellow sprinkled with few russet lines and nettings; dots numerous, small, russet, conspicuous; flesh tinged with yellow, firm, coarse and granular especially near the core, tender, very juicy, sweet, aromatic, pleasing but not richly flavored; quality good; core unusually large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, very wide, long, plump, acuminate.

LINCOLN CORELESS. The product of Lincoln Coreless is worthless for dessert, and but a coarse makeshift for culinary purposes. The variety receives attention only because the pear is a monstrosity and a curiosity. The fruits are enormous in size, outweighing all other pears unless it be those of the Pound. They are unique in having a very small core and few or sometimes no seeds. They are further characterized by very late maturity, ripening later than any other pear and keeping until April. While usually rather dull greenish-yellow in color, the cheek is often enlivened by a bright blush which makes the fruits attractive despite their grossness. The catalogs describe the trees as "blight proof," but they blight. Lincoln Coreless originated in Lincoln County, Tennessee, about 1830.

Tree medium to small, vigorous, upright, very dense, pyramidal, hardy, an uncertain bearer; trunk shaggy; branches smooth, zigzag, reddish-brown, marked with small lenticels. Leaves 3 inches long, 1⅝ inches wide, elongated-oval, leathery; apex taper-pointed; margin finely serrate; petiole 1½ inches long, reddish; stipules very long. Flowers 1¾ inches across, very large and showy, average six buds in a cluster. Fruit ripe in February; very large, 5¼ inches long, 3 inches wide, uniform in size, obovate-acute-pyriform, somewhat ribbed, with unequal sides; stem 1⅜ inches long, thick, curved; cavity obtuse, shallow, narrow, russeted, furrowed, often lipped; calyx open, large; lobes separated at the base, narrow, acute; basin very shallow, narrow, obtuse, furrowed; skin very thick, tough, coarse and granular, smooth, dull; color greenish-yellow, with a handsome pinkish-red blush on the cheek exposed to the sun; dots many, brownish-russet, very conspicuous; flesh yellowish-white, very firm, granular at the core, crisp, tough, medium juicy, rather bitter and astringent; quality poor; core closed, with clasping core-lines; calyx-tube long, wide, conical; seeds few, narrow, often abortive, acute.

LOUISE BONNE DE JERSEY. *Louise.* Now known in America as Louise, this variety is described here under the name used in English and American pomologies to distinguish it from at least eight other varieties having Louise as the whole or a part of the name. The variety has many excellent qualities of fruit and tree, which, however, are not sufficiently above the average to give it high place in the list of pears for the market. The fruits are medium to large, handsome, of excellent quality and keep and ship well. The trees are precariously hardy and somewhat subject to blight, but very vigorous, productive, and long-lived. In Europe, the fruits are better and the trees more productive when worked on the quince, and in America the variety is considered one of the best for dwarfing. This pear is a standard one for home collections, and finds favor in many commercial orchards. The parent tree of this pear was raised from seed about 1780 by M. de Longueval, Avranches, Normandy.

Tree large, vigorous, upright, very tall, dense-topped, hardy, productive, long-lived; trunk stocky; branches slightly zigzag, reddish-brown, with numerous raised lenticels. Leaves 3¼ inches long, 1¾ inches wide, much curled under at the margin, oval, leathery; apex slightly taper-pointed; margin glandless, finely serrate; petiole 1½ inches long, slender. Flowers with a disagreeable odor, 1½ inches across, white or sometimes faintly tinged with pink along the edge of the petals, averaging 6 buds in a cluster. Fruit matures in October; medium to large, often 2⅞ inches long, 2¼ inches wide, oblong-pyriform, somewhat irregular, stem 1 inch long, slender, usually curved; cavity obtuse, shallow, narrow, furrowed and wrinkled, often lipped, the flesh folded up around the stem; calyx open, large; lobes broad, acute; basin obtuse, furrowed and uneven; skin granular, smooth; color pale yellow, marked on the exposed cheek with a dull pinkish-red blush and with streaks of russet; dots numerous, small, grayish or russet, conspicuous; flesh yellowish-white, tender and melting, very juicy; sweet, aromatic, rich; quality very good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute.

LUCRATIVE: See Belle Lucrative.

LUCY DUKE. Why Lucy Duke is neglected is hard to see. The pear has a rich, juicy, spicy, melting flesh that makes it one of the best. In form, the fruits resemble those of Bartlett, which is probably one of the parents; they are but medium in size, but are of a beautiful golden russet color, which makes them as handsome as the handsomest. The skin is thick and the pears stand shipping well. The variety can be recommended for home and local markets, but the trees are unproductive and too irregular in bearing for commercial orchards. The tree is hardy, but only moderately vigorous, and resembles Winter Nelis, supposed to be the other parent, in habit of growth. The variety is relatively free from blight. Lucy Duke was grown about 1880 by Mrs. Lucy Duke of Beaufort County, North Carolina, from seed of a Bartlett pear.

Tree medium to large, variable in vigor, upright becoming slightly spreading, dense-topped, hardy, very

productive; trunk shaggy; branches thick, zigzag, marked by numerous, elongated lenticels. Leaves 3 inches long, 1⅜ inches wide, thin; margin occasionally glandular, finely serrate or entire; petiole 1½ inches long, slender. Flowers open late, 1⅝ inches across. Fruit ripens in late October and November; medium in size, oblong-pyriform, symmetrical; stem short, thick, curved; cavity obtuse, shallow, narrow, russeted, often wrinkled and occasionally lipped; calyx large, open, rounded and with a deeply set center; basin obtuse, smooth, symmetrical; skin very tough, roughened with thick russet; color greenish-yellow, overspread with dark russet, changing to golden russet on the cheek exposed to the sun; dots numerous, small, russet, obscure; flesh yellowish-white, fine, melting, rich, juicy, sweet; quality very good; core large, closed, axile; calyx-tube short, wide, broadly conical; seeds large, wide, long, plump, acute.

MADELEINE. Madeleine has long been a dependable summer variety, the crop of which ripens just before that of Bloodgood. Many consider it the best very early summer pear. The fruits are attractive in appearance, and very good in quality; but their season is short, their skins are tender, and the flesh quickly softens at the core. While the trees are productive, they are not resistant to blight, do not hold their crop well, are tender to cold, and are short-lived. The variety is worth planting only for the sake of succession in crop, and in large collections of pears. Madeleine was cultivated by Le Lectier in his garden at Orléans in 1628; no other author had made previous mention of it.

Tree large, vigorous, upright, open-topped, hardy, productive; trunk shaggy; branches zigzag, light greenish-brown. Leaves 3 inches long, 1½ inches wide, thin; apex taper-pointed, margin glandless, finely serrate; petiole 1¾ inches long, glabrous, reddish-green. Flowers showy, 1⅜ inches across, in dense clusters, average 11 buds in a cluster. Fruit ripens in early August; 2⅛ inches long, 2 inches wide, roundish-obtuse-pyriform; stem 1½ inches long, thick, curved; cavity very shallow and narrow or lacking, the flesh folded in a lip on one side of the stem; calyx partly open; lobes separated at the base, short, narrow, acuminate; basin shallow, narrow, obtuse, gently furrowed, symmetrical; skin thin, smooth, very tender; color dull green, occasionally with faint dotted brownish blush; dots numerous, greenish, obscure; flesh slightly tinged yellow, granular at the center, tender and melting, very juicy, sweet, vinous; quality good to very good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds wide, short, plump, acuminate.

MALINES: See Joséphine de Malines.

MARGARET. The fruits of Margaret are early and attractive in color and shape, but they run small in size, and in neither flesh nor flavor can they compete with the product of several other varieties of the same season. The trees are hardly more desirable than the fruits, since they are tender to cold, blight badly, and are short-lived, seldom attaining full size or large size. Despite these defects of fruit and tree, the variety is a one-time favorite still rather commonly planted. Better summer pears can be found for almost every part of the country. In the middle of the nineteenth century, Christopher Wiegel, Cleveland, Ohio, planted seeds from one of which came this variety.

Tree medium in size, vigorous, spreading, drooping, open-topped, productive; trunk shaggy; branches medium in thickness and smoothness, brown mingled with much red, marked by numerous lenticels. Leaves 3 inches long, 1¾ inches wide, thin; margin tipped with few pinkish glands, finely serrate; petiole 1¾ inches long, green; stipules of medium size. Flowers showy, 1¾ inches long, large, in dense clusters, 6 or 8 buds in a cluster. Fruit matures in late August and early September; medium in size, 3½ inches long, 3 inches wide, oblong-obovate-pyriform, irregular; stem 1¼ inches long, thick, curved; cavity acuminate, deep, narrow, russeted, furrowed and compressed, often with a pronounced lip; calyx open, large; lobes separated at the base, broad, acute, reflexed; basin deep, abrupt, furrowed, often compressed; skin thin, tender, smooth; color dull greenish-yellow, often with a deep but dull reddish-brown blush and occasional patches of russet; dots numerous, small, green or russet, obscure; flesh fine under the skin but granular and gritty near the center; tender, buttery, very juicy, faintly vinous, slightly aromatic; quality good; core large, closed, with clasping core-lines; calyx-tube long, wide, funnel-shaped; seeds large, wide, plump, obtuse or acute.

MARIE LOUISE. Fig. 89. The fruits of Marie Louise are among the perfections of Nature, and were the tree more certain in bearing and less fastidious as to environment, the variety would rank as one of the best of all pears. The flesh is tender and melting, very juicy, and the flavor is a most delectable commingling of refreshing piquancy and scented sweetness. In shape, the pears resemble a short Beurré Bosc, having the same trim contour, but the color is very different—rich yellow, netted and sprinkled with russet, and sunflecked with red on the sunny side. The fruits are somewhat susceptible to the scab fungus, and even the most careful spraying fails to give them a fair cheek some seasons. The trees are hardy but only moderately vigorous, somewhat susceptible to blight, rather uncertain in bearing, and vary much from season to season in abundance and quality of product. Not at all suited for a commercial plantation, Marie Louise is one of the choicest sorts for a home collection. The Abbé Duquesne, Mons, Belgium, raised this pear from seed in 1809.

89. Marie Louise. (×½)

Tree medium in size, vigorous, spreading, open-topped, slow-growing; hardy, productive; trunk slender; branches dark reddish-brown, marked with many large, very conspicuous lenticels. Leaves 2½ inches long, 1¼ inches wide, narrow, short, oval or somewhat elongated, leathery; apex obtusely or slightly taper-pointed; margin glandless, entire; petiole 2 inches long, greenish, glabrous, slender. Flowers very showy, 1¾ inches across, in dense clusters, 7 to 9 buds in a cluster. Fruit ripe in late September and early October; above medium in size, 3⅛ inches long, 2⅝ inches wide, variable in size, oblong-pyriform, irregular; stem 1⅛ inches long, thick, curved; cavity small and one-sided, russeted, often lipped; calyx large, open; lobes separated at the base, narrow, acuminate; basin obtuse, furrowed; skin thin, tender, smooth, dull; color rich yellow, netted and sprinkled with russet on the exposed cheek; dots numerous, small, russet, obscure; flesh yellowish-white,

granular, tender, buttery, very juicy, aromatic, with a rich, vinous flavor; quality very good; core closed, with clasping core-lines; calyx-tube short, narrow, conical; seeds wide, acute.

MOUNT VERNON. Fig. 90. As a distinct type, and because the pears ripen at a season when there are few other varieties of this fruit, Mount Vernon has a prominent place in the list of worthy American pears. The top shape and reddish-russet color make this a unique pear in appearance, and the greenish-yellow, granular, spicy, piquant flesh constitute very distinct characters in the quality of the fruits. Lack of uniformity in shape and small size are the chief defects. The variety becomes further valuable because it ripens in early winter, and under good conditions may be kept until midwinter. The tree is vigorous but has a small, dense head with numerous, short, stocky branches, many of which droop, the aspect given the top by these peculiarities being quite distinct. The variety is worthy when a winter pear is wanted whether for home or market. Mount Vernon originated from a chance seedling in the garden of Samuel Walker, Roxbury, Massachusetts, about 1847.

90. Mount Vernon. (×½)

Tree large, vigorous, spreading, with many drooping branches, dense-topped, hardy, productive, long-lived; trunk stocky, medium to rough; branches thick, somewhat shaggy, reddish-brown, marked by few large lenticels. Leaves 2½ inches long, 1½ inches wide, oval, medium to thick, leathery; apex taper-pointed; margin crenate, tipped with rudimentary glands; petiole 1¼ inches long. Flowers 1⅜ inches across, in dense clusters, 7 to 9 buds in a cluster. Fruit ripe in late October and November; medium in size, 2½ inches long, 2⅛ inches wide, uniform in size, oblong-pyriform, with unequal sides; stem 1 inch long, thick, usually curved; cavity obtuse, shallow and narrow, russeted, furrowed, often heavily lipped; calyx open; lobes short, narrow, acuminate; basin narrow, obtuse, smooth, symmetrical; skin granular, roughened by russet, dull; color light russet overspreading a greenish-yellow ground, with a brownish-red blush on the exposed cheek, dotted and netted with russet; dots numerous, small, russet, obscure; flesh with a faint tinge of yellow, granular, tender and melting, juicy, sweet, aromatic; quality good to very good; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds variable in size, wide, long, plump, acute, many abortive.

OLIVIER DE SERRES. This variety is rated in Europe as a valuable late winter pear, and the pomological writers of the last century give it all of the virtues on this side of the Atlantic ascribed to it by Europeans. A closer study of the variety in America shows that it does not possess these merits. The quality of the pear as grown here is below that of several other sorts of its season; the flesh is coarse and gritty and the flavor mediocre. The tree-characters are good, but are not sufficiently good to offset the faults of the fruits. Olivier de Serres was raised from seed about the middle of the nineteenth century by M. Boisbunel, Rouen, France.

Tree medium in size, vigorous, dense-topped, upright-spreading, productive; trunk and branches medium in thickness and smoothness, marked with numerous lenticels. Leaves 2¾ inches long, 1¼ inches wide; apex taper-pointed; margin glandular, finely serrate; petiole 2 inches long, slender. Flowers with an unpleasant odor, showy, 1 9/16 inches across. Fruit ripens January-March, medium in size, 2½ inches long, 2¾ inches wide, roundish-obtuse-pyriform, truncate at both ends, irregular in outline; stem variable in length, averaging ¾ inch long, thick, enlarged at the top, curved; cavity broad, slightly furrowed; calyx large, open; basin variable in depth, furrowed; skin tender; color greenish-yellow, partly overspread with cinnamon-russet and sometimes with a slight dull blush on the exposed cheek; flesh whitish, variable in texture, juicy, varying from sweet to a brisk vinous flavor; quality poor unless grown under the most favorable conditions.

ONONDAGA. *Swan's Orange.* Some seventy or eighty years ago this pear was widely introduced under the names Onondaga and Swan's Orange, and for a generation was much grown in eastern pear regions. It has now practically passed from cultivation in commercial orchards, but is still to be found in collections and home plantings. The fruits are large, handsome, and of very good quality, resembling those of Bartlett in flavor and with even better flesh-characters. The trees are vigorous, hardy, and fruitful, but so susceptible to blight that the variety can never have commercial value in American orchards. Whether or not it is worth planting in home orchards depends on the planter's willingness to suffer loss from blight. The variety originated with a Mr. Curtiss, Farmington, Connecticut, about 1790.

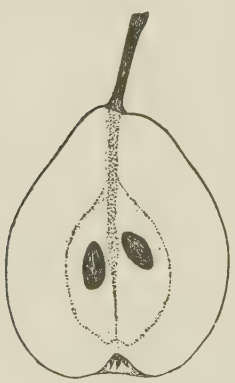
Tree medium in size, vigorous, spreading, open-topped, very productive; branches zigzag, reddish-brown, marked with many large lenticels. Leaves 3 1/16 inches long, 1¼ inches wide, narrow, oval inclining to lanceolate, stiff, leathery; apex taper-pointed; margin coarsely but shallowly serrate, tipped with many reddish glands; petiole 1⅞ inches long, light green mingled with red. Blossoms 1⅛ inches across, in dense clusters, 7 to 8 buds in a cluster. Fruit ripe in early October; above medium to large, 2¾ inches long, 2½ inches wide, obovate-obtuse-pyriform, symmetrical, with unequal sides; stem 5/8 inch long, thick, curved; cavity a slight depression, with fleshy enlargement at one side of the stem; calyx closed; lobes narrow, acute; basin narrow, obtuse, furrowed, uneven; skin granular, tender, smooth, dull; color rich, pale yellow, with a few lines of russet and with many russet spots; dots numerous, small, russet, conspicuous; flesh yellowish, granular both near the skin and at the center, melting, buttery, very juicy, aromatic, with a sweet, rich, vinous flavor; quality very good; core large, closed, with clasping core-lines; calyx-tube long, conical; seeds narrow, long, acute.

ONTARIO. Ontario was introduced nearly seventy years ago with the expectation that the crop would follow that of Bartlett and be in as great demand. While the variety has not come up to expectations, it is too good to discard. The fruits are of the type of Bartlett, but are smaller and usually lack the blush. The trees are very satisfactory. The variety fails chiefly in the small size of the fruits. Ontario was raised from seed in the nurseries of W. & T. Smith, Geneva, New York.

Tree large, vigorous, upright, open-topped, hardy, productive; trunk stocky; branches thick, roughish, dull reddish-brown, marked by small lenticels. Leaves 2 inches long, 1½ inches wide, oval, thin, leathery; apex abruptly pointed; margin glandular toward the apex, very finely serrate; petiole 1½ inches long. Flowers 1⅛ inches across, in a scattering raceme, from 8 to 10 buds in a cluster. Fruit in season from the middle to the last of September; medium in size, 2½ inches long, 1⅞ inches wide, uniform in size and shape, oblong-pyriform, with sides usually unequal; stem ¾ inch long, thick; cavity obtuse, shallow, narrow, often russeted and lipped; calyx open; lobes separated at the base, narrow, acute; basin shallow to medium, obtuse, gently furrowed, sometimes compressed; skin smooth, dull; color pale yellow with small patches and streaks of light colored russet; dots numerous, very small, russet, obscure; flesh whitish, with a yellow tinge at the core, granular, firm but tender, juicy, sweet, slightly aromatic; quality good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute.

PASSE COLMAR. This is one of the standard winter pears in England. The fruits are exceedingly sugary and mildly spiced with cinnamon, a flavor so unique, especially when compared with the piquant flavor most common in winter pears, that the variety is worth growing where it succeeds for the sake of diversity. On unsuitable soils and under indifferent care, the pears are unattractive and poor in quality. The variety does not thrive on heavy cold clay but requires a light, warm soil. The trees are very vigorous on heavy soils, with the result that the fruits are many but small and poor; checking vigor by dwarfing on quince or planting on poor soil suits the variety. The trees are hardy and as free as the average pear from blight. The variety is a good winter sort for home or market. This variety was raised in 1758 at Mons, Belgium, by the Abbé Hardenpont.

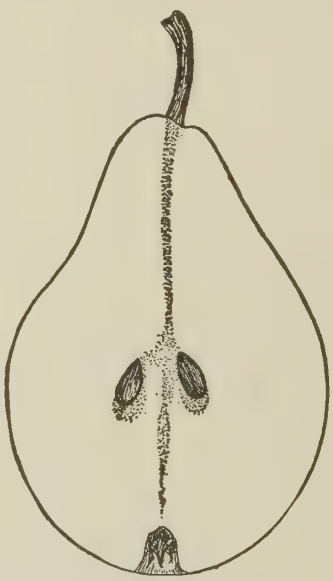
Tree vigorous, upright, tall, rapid-growing, productive; trunk slender; branches reddish-brown, marked by large, conspicuous glands. Leaves 3 inches long, 1½ inches wide, leathery; apex taper-pointed; margin tipped with few small glands, finely serrate to nearly entire; petiole 2 inches long, glabrous, pinkish-green. Flowers late, showy, 1¾ inches across, unusually large, in dense clusters, average 6 buds in a cluster. Fruit ripe December-January; 2½ inches long, 2⅛ inches wide, obovate-obtuse-pyriform, somewhat irregular; stem 1 inch long, very thick; cavity obtuse, shallow, narrow, russeted, furrowed; calyx partly open; lobes separated at the base, narrow, acute; basin shallow, narrow, obtuse, gently furrowed; skin thick, granular, tender, roughish; color greenish-yellow, with reddish-brown and russet patches and nettings; dots numerous, small, russet, obscure; flesh tinged with yellow, granular, tender, buttery, very juicy, sweet, vinous, aromatic; quality very good; core large, closed, with clasping core-lines; calyx-tnbe short, wide, conical; seeds large, wide, plump, acute.



91. P. Barry. (×½)

P. BARRY. Fig. 91. The fruits of P. Barry do not ripen until March or April and keep until late May. A serious defect is that they sometimes refuse to ripen but shrivel and decay. The pears are excellent in flavor, have good flesh-characters, and when properly ripened are excelled in quality by no other winter pear. The variety should have a place in the collection of every pear fancier to extend the season for this fruit, and commercial pear-growers might find it a profitable sort for local market. Unfortunately, the trees are small, fastidious, as to environment and somewhat uncertain in bearing. Bernard S. Fox, San José, California, raised many pears from seeds of Belle Lucrative; among these seedlings was one which fruited first in 1873 and was named in honor of Patrick Barry.

Tree variable in size, lacking in vigor, spreading, open-topped, unusually hardy; trunk slender; branches stocky, zigzag, reddish-brown, marked with large lenticels. Leaves 1¾ inches long, 1⅛ inches wide, leathery; apex abruptly pointed; margin finely serrate, tipped with few glands; petiole 1¼ inches long. Flowers open late, 1¼ inches across, well distributed, averaging 7 buds in a cluster. Fruit matures in late November and December; averaging 2¾ inches long, 2¼ inches wide, oblong-obtuse-pyriform, irregular, with unequal sides; stem 1 inch long, thick, curved; cavity obtuse, narrow, furrowed, compressed, often lipped; calyx small, open; lobes separated at the base, short, narrow, obtuse; basin shallow, narrow, obtuse, smooth and regular; color rich yellow, almost entirely overspread with russet; dots numerous, small, russet, conspicuous; flesh yellowish-white, fine, melting, sweet, juicy, with a rich, vinous aromatic flavor; quality good; core large, closed, with clasping core-lines; calyx-tube short, conical; seeds large, wide, long, plump, acute.



92. Pitmaston. (×½)

PITMASTON. Fig. 92. *Pitmaston Duchess.* Although this fine old English pear has more than ordinary merit, it seems to be little grown in America. In appearance, the pears are unsurpassed. On warm soils or in warm seasons, the flavor is choicely good, but in cold soils and seasons, the flavor is often austere, or even acid and astringent. The season prolongs that of

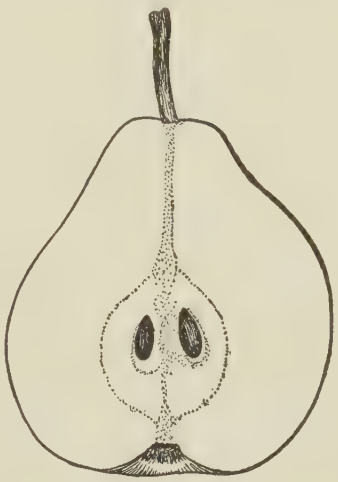
Bartlett, and as the fruits are flavored very differently, being more piquant and refreshing, and are ordinarily larger and handsomer, Pitmaston ought to make a good market sort where the variety thrives. The subacid flavor makes this one of the very best pears for culinary purposes. The fruits keep and ship well. The trees have fewer faults than those of most of the standard varieties. They are hardy, vigorous, fairly immune to blight, and while but moderately productive, bear annually, and the large size of the fruits make them high yielders. The variety should be put on probation by those who grow for the markets, and is well worthy a place in all home orchards. Pitmaston was raised by John Williams, Pitmaston, England, in 1841.

Tree large, vigorous, spreading, dense-topped; trunk stocky, shaggy; branches thick, slightly zigzag, reddish-brown, marked with numerous, large lenticels. Leaves 2½ inches long, 1½ inches wide, leathery; apex abruptly pointed; margin finely serrate; petiole 1¾ inches long. Flowers showy, 1¾ inches across, well distributed, average 7 buds in a cluster. Fruit ripe in October; large, 3¼ inches long, 2½ inches wide, oblong-obovate-pyriform, symmetrical; stem 1 inch long, thick, often curved; cavity very shallow and very narrow or lacking, the flesh drawn up in a wrinkled fold around the base of the stem, often lipped; calyx closed, large; lobes long, broad, acute; basin shallow, obtuse, furrowed and wrinkled; skin thin, granular, smooth, tender, dull; color pale lemon-yellow, dotted and patched with light russet, especially around the stem, without blush; dots numerous, small, russet, conspicuous; flesh tinged with yellow, firm, somewhat granular, melting, buttery, very juicy, piquant and vinous; quality good to very good; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds narrow, long, flat, acute, very often abortive.

POUND. Pound is grown in collections for its monstrous fruits. The pears not infrequently weigh three pounds, and one is noted weighing four pounds, nine ounces. The pears are coarse in form, texture and flavor—but one degree better in flavor than the potato-like fruits of Kieffer and even more sappy. The pears keep well, and are fairly good for culinary purposes. The trees are unusually satisfactory, because of which the variety should make a good parent from which to breed. This is a very old pear of uncertain origin, possibly dating back to Pliny, who wrote about eighty years after the beginning of the Christian era.

Tree upright, dense-topped, hardy, very productive; trunk stocky, shaggy; branches thick, shaggy, zigzag, dull reddish-brown, marked with many large lenticels. Leaves 3¼ inches long, 1¾ inches wide, ovate, thin, stiff; apex taper-pointed; margin glandular, finely serrate; petiole 1¾ inches long, slender. Flowers open early, 1⅜ inches across, large, well distributed, average 7 buds in a cluster. Fruit matures in February; large, 4 inches long, 2⅞ inches wide, obovate-acute-pyriform, with unequal sides; stem long, thick, curved; cavity obtuse, shallow, narrow, russeted, furrowed, drawn up in a fleshy ring about the stem; calyx large, open; lobes separated at the base, obtuse; basin shallow, narrow, obtuse, slightly furrowed, symmetrical; skin thick, tough, dull, roughened by the dots and by russet markings; color golden-yellow, often marked on the exposed cheek with a bronze or pinkish blush; dots numerous, russet, very conspicuous; flesh yellowish, firm, granular, very tough, subacid, inferior in flavor; quality very poor; core large, closed, axile, with meeting core-lines; calyx-tube short, wide, conical; carpels pear-shaped; seeds very large, brownish-black, wide, long, acuminate.

PRÉSIDENT DROUARD. Fig. 93. *Drouard.* Président Drouard is a comparatively new pear in America, and in its probationary period the fruits are making a favorable impression. The pears ripen in late autumn and are of the type of those of Beurré d'Anjou, a



93. Président Drouard. (×½)

little yellower in color, and, all in all, more attractive in appearance. The quality is none too good for dessert. The trees are hardy and vigorous but blight rather badly. The variety is worth trying for the markets. Président Drouard is a chance seedling found in the suburbs of Pont-de-Ce, France, by M. Olivier, about 1886.

Tree of medium size, spreading, open-topped, hardy; branches reddish-brown, marked with small lenticels. Leaves 3 inches long, 1¾ inches wide, oval, thick, leathery; apex taper-pointed; margin glandless or with but few glands, entire or coarsely serrate; petiole glabrous, greenish, thick, 1⅝ inches long, tinged red. Flowers 1⅜ inches across, in dense clusters, 6 to 9 buds in a cluster. Fruit in season from late November to December; large, averaging 3½ inches long, 3 inches wide, oblong-obovate-pyriform, with unequal sides; stem 1 inch long, very thick and woody; cavity obtuse, deep, irregular, furrowed, usually lipped; calyx large, open; lobes separated at the base, long, narrow, acuminate; basin deep, abrupt, usually smooth but sometimes gently furrowed; skin thick, tough, rough, dull; color clear lemon-yellow, with nettings and streaks of russet; dots numerous, small, russet, obscure; flesh tinged with yellow; very granular at the core, tender and melting, buttery, juicy, aromatic, sweet; quality good; core large, closed, axile, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute, occasionally abortive.

REEDER. Reeder is another of the pears too good to discard, and not quite good enough to give an ardent recommendation. In quality the fruits rank but little below those of Seckel; are about the same size as grown under average conditions; but are even duller and less attractive in color than the modest fruits of Seckel. The variety has a place in the home and markets as a pear to follow Seckel, as the crop comes in season just after that of Seckel passes out. The trees make but a short, slender

growth until well established in the orchard, after which they become of medium size but very vigorous. The branches droop as do those of Winter Nelis, although not so markedly. The variety is nearly blight-proof. Reeder is a seedling raised about 1855 by Dr. Henry Reeder, Varick, New York, from seed of Winter Nelis.

Tree spreading, becoming drooping with age, open-topped, productive; trunk and branches medium in thickness and smoothness; branches zigzag, reddish-brown, sprinkled with numerous lenticels. Leaves 2¾ inches long, 1½ inches wide, leathery; apex taper-pointed; margin crenate to nearly entire, petiole 2 inches long, tinged with red; stipules few, very small, reddish-green. Flowers 1¼ inches across, in dense clusters, average 9 buds in a cluster. Fruit ripe October-November; small, averaging 1¾ inches long, 1⅞ inches wide, globular-obtuse-pyriform, ribbed and irregular; stem 1¼ inches long, slender, curved; cavity a very small depression in which is inserted the base of the stem, symmetrical; calyx large, open; lobes separated at the base, long, narrow, reflexed, acuminate; basin shallow and narrow, smooth; skin thick, smooth, tender; color dull greenish-yellow, mottled and streaked with russet, blushed faintly on the exposed cheek with brownish-red; dots few, small, obscure, greenish or russet; flesh white, granular toward the center but fine-grained near the skin, tender, somewhat stringy, very juicy, aromatic; quality good; core large, closed, with clasping core-lines; calyx-tube long, narrow, funnel-shaped; seeds unusually large, wide, long, plump, acute.

RIEHL BEST. Riehl Best is as nearly blight-proof as any other European pear. It might well be tried in localities where standard sorts cannot be raised because of blight, and is worth growing in breeding work as a parent to obtain blight-resistant varieties. The pears are unattractive in appearance, but are excellent in quality. The flesh is juicy, tender, vinous, free from grittiness and seldom rots at the core. The trees are hardy to heat and cold and bear annually. This pear was discovered by Edwin H. Riehl, Godfrey, Illinois. It is probable that Riehl Best is an old European pear renamed.

Tree large, vigorous, upright, dense-topped, rapid-growing, productive; trunk stocky; branches thick, light reddish-brown, marked with numerous large lenticels. Leaves 3 inches long, 1¾ inches wide, thick; apex abruptly pointed; margin glandless, variable in serrations; petiole 2 inches long. Flowers 1⅝ inches across, in dense clusters, average 6 buds in a cluster. Fruit ripens in October; medium in size, 2½ inches long, 2 inches wide, obovate-conic-pyriform, irregular, with unequal sides; stem 1⅛ inches long; cavity very shallow and narrow or lacking, the flesh drawn up in a lip on one side of the stem; calyx open; lobes separated at the base, broad, obtuse; basin obtuse, furrowed; skin thick, roughened with russet; color dull yellow, overlaid with patches of russet, with distinct russet dots and with a faint trace of red on the cheek next the sun; dots numerous, russet, conspicuous; flesh tinged with yellow, granular under the skin, tender, moderately juicy, vinous; quality good; core large, closed, axile, with meeting core-lines; calyx-tube short, wide, conical; carpels ovate; seeds medium in size, width, and plumpness, obtuse.

ROOSEVELT. This variety is still on probation in America, with the chances strongly against it proving worthy of general cultivation. The fruits are too small, too poorly colored, and too poor in quality to compete with those of a score of other sorts of the same season. The core is remarkably small, and the seeds are few and small, but these are insufficient merits to count against the several defects named. The tree is robust and generally satisfactory. In Europe the variety was heralded as a most remarkable sort—one "destined to bring about a revolution in pear-growing." It may be worth further trial in this country. This pear was introduced in 1905 by the noted French pomologist Charles Baltet, Troyes, France.

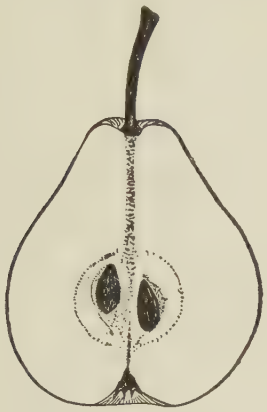
Tree medium to large, vigorous, very upright, dense-topped, rapid-growing; trunk slender, smooth; branches slender, smooth, glossy, reddish-brown, marked with numerous, small, raised lenticels; branchlets characteristically thick, with blunt ends. Leaves 3 inches long, 1⅜ inches wide, stiff; apex taper-pointed; margin usually glandless, finely serrate to almost entire; petiole 2 inches long, slender, curved. Flowers with a disagreeable odor, early, showy, 1⅝ inches across, in dense clusters, average 7 buds in a cluster. Fruit ripens in late September and October; medium in size, about 2 7/16 inches in length and width, roundish-obtuse-pyriform, symmetrical; stem 1 inch long, thick; cavity very shallow or lacking, faintly lipped; calyx very open, large; lobes separated at the base, narrow, acute; basin shallow, wide, obtuse, smooth, symmetrical; skin thick, tough, smooth, dull; color pale lemon-yellow, mottled somewhat and netted with russet, with the faintest trace of a blush; dots numerous, small, light russet, obscure; flesh very light salmon, fine-grained except at the center which is slightly granular, tender and melting, very juicy, mildly sweet, without much character; quality medium; core small, closed, axile, with clasping core-lines; calyx-tube long, very wide, conical; carpels cordate; seeds wide, acute.

RUTTER. Rutter is a most excellent late autumn variety. The pears are good or very good in quality, attractive, keep well, ship well, and sell well to those who know the variety. The trees have a combination of good characters that commend them most highly. Thus, they are comparatively immune to blight; enormously productive, though they have a tendency to bear every other year; bear early, grow rapidly, live long, and are hardy. The fruits hang exceptionally well to the trees, so that the variety is a valuable one for exposed situations. The variety can be recommended for both home and market plantations. This variety was raised by John Rutter, West Chester, Pennsylvania, from seed of Léon Leclerc about sixty years ago.

Tree large, vigorous, upright, dense-topped, rapid-growing, productive; trunk stocky; branches thick, reddish-brown, sprinkled with very conspicuous lenticels. Leaves 3⅝ inches long, 1⅝ inches wide, thick, leathery; apex taper-pointed; margin nearly glandless, almost entire; petiole 2 inches long, glabrous, reddish-green. Flowers very showy, 1⅜ inches across, almost in racemes, 6 or 8 buds in a cluster. Fruit matures in late October and early November; large, 3⅛ inches long, 3 inches wide, roundish-obtuse-pyriform, with a very thick, blunt neck, with unequal sides; stem ¾ inch long, thick, woody; cavity acuminate, unusually large, deep, russeted, occasionally furrowed and wrinkled, slightly lipped; calyx small, open; lobes separated at the base, short, narrow, acute; basin deep, obtuse, smooth, symmetrical; skin thick, gritty, roughish, dull; color yellow overspread with light-colored russet, mottled and flecked with russet; dots numerous, small, russet, conspicuous; flesh whitish, granular at the center, tender and melting, juicy, aromatic, sweet but refreshing; quality good to very good; core small, closed, abaxile, with meeting core-lines; calyx-tube long, conical; seeds small, almost roundish, plump, obtuse.

SECKEL. Fig. 94. Among the several hundred pears that are or have been grown on this side of the Atlantic, Seckel stands almost alone in vigor of tree, productiveness, and immunity

to blight, and is equalled by no other variety in high quality of fruit. If the fruits were larger, Seckel would challenge the world as a pear for the markets as it now does as a pear for the home orchard. After Bartlett and the

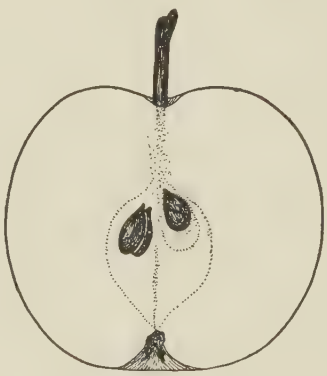


94. Seckel. (×½)

disreputable Kieffer, it is now more grown than any other variety in America. The fruits are small, not highly colored, but attractive because clean and trim in contour. The flesh is melting, juicy, perfumed and most exquisitely and delicately flavored, with the curious character of having much of its spicy, aromatic flavor in the skin which should never be discarded in eating. The reddish-brown color of the fruit is another distinguishing character of Seckel. Another distinctive character is that the fruits do not lose much if any by ripening on the tree. Besides being nearly iron-clad in resistance to blight and very productive, the trees are as hardy as those of any other pear, and are remarkable for their large, compact, broadly pyramidal tops. The tree is further distinguished by its short-jointed, stout, olive-colored wood, and its habit of bearing fruits in clusters on the ends of the branches. Its blossoms are markedly self-fertile. There are several faults of fruit and tree: thus, the fruits are small and do not keep after maturity; fruit and foliage are susceptible to scab; the pears are too small for commercial canning; and the trees are late in coming in bearing. Notwithstanding these several faults, Seckel is usually a profitable commercial variety, as a well-grown crop almost always commands a fancy price. For the home orchard, it has no rival in any part of North America where European varieties are grown. Seckel is supposed to have originated as a chance seedling soon after the Revolutionary War near Philadelphia, Pennsylvania.

Tree very large, very vigorous, upright-spreading, dense-topped, hardy, very productive, long-lived; trunk stocky; branches thick, reddish-brown, covered with small lenticels. Leaves 2½ inches long, 1½ inches wide, oval, leathery; apex taper-pointed; margin finely serrate; petiole 1½ inches long; stipules very long when present. Flowers 1¼ inches across, in dense clusters, 7 or 8 buds in a cluster. Fruit ripe in October; small, 2 inches long, 1⅞ inches wide, uniform in size and shape, obovate, symmetrical; stem ½ inch long, short, thick, often curved; cavity obtuse, with a shallow, narrow depression, symmetrical; calyx small, partly open; lobes separated at the base, short, variable in width, acute; basin shallow, narrow, strongly obtuse, symmetrical; skin smooth, dull; color yellowish-brown, lightly marked with pale russet and often with a russet-red cheek; dots numerous, very small, russet or grayish; flesh white, with a faint tinge of yellow, slightly granular, melting, buttery, very juicy, sweet, with an exceedingly rich, aromatic, spicy flavor; quality very good to best; core small, closed, with clasping core-lines; calyx-tube short, conical; seeds small, short, not very plump, obtuse.

SHELDON. Fig. 95. The fruits of Sheldon satisfy both the eye and the palate; no rival in season surpasses them in either appearance or quality. While not large, they are of sufficient size to meet the demands of a good dessert fruit. The shape is a perfect turbinate, truncated at the base, and is usually symmetrical and uniform. In color, the pears are very distinctive, the whole fruit being more or less russeted, with a handsome ruddy cheek. The flesh is melting and juicy, and deserves more than almost any other pear the adjective luscious; it is sweet, vinous, and highly perfumed with a pleasant musky aroma. The



95. Sheldon. (×½)

fruits keep and ship well, and are esteemed both for dessert and culinary purposes. The trees, while large, vigorous, and hardy, are not productive, blight as badly as any pear in the orchard, are reluctant in coming in bearing, and seldom hold their crop well, so that in exposed positions the wind takes great toll. These faults of the tree keep Sheldon from being a commercial variety of high rank, but the fine fruits make it worth growing in the home orchard or for the markets where the faults of the trees are not too marked. This pear is a native of the town of Huron, Wayne County, New York. The original tree stood on the premises of Major Sheldon, having sprung from seed planted about 1815.

Tree large, vigorous, upright-spreading, rapid-growing, hardy, productive; trunk stocky; branches thick, reddish-brown, marked with large lenticels. Leaves 2½ inches long, 1¼ inches wide, oval, leathery; apex taper-

pointed; margin finely serrate; petiole 1½ inches long. Flowers 1⅛ inches across, in dense clusters, 13 or 14 buds in a cluster. Fruit matures in October; large, 2¾ inches long, 2½ inches wide, uniform in size and shape, turbinate, symmetrical; stem ¾ inch long, thick, nearly straight; cavity obtuse, deep, furrowed, occasionally lipped; calyx large, open; lobes very broad, obtuse; basin wide, obtuse, symmetrical; skin thick, granular, tender, roughish; color dull greenish-yellow with a faint brownish-red blush overspread with russet nettings and streaks; dots numerous, small, russet; flesh whitish, somewhat granular, tender and melting, very juicy, sweet and vinous, with a rich and pleasantly aromatic flavor; quality very good to best; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds acute.

SOUVENIR DU CONGRÉS. Fig. 96. *Congress, Souvenir.* Very similar to Clapp Favorite and Bartlett, and not as good as either in fruit, Souvenir du Congrès hardly merits a place in American pomology. Yet

96. Souvenir du Congrès. (×½)

since the crop ripens between those of the two sorts with which it has been compared, and because the fruits are larger and often handsomer, the variety may be worthy a place in collections. The fruits are said to be larger and of better quality when the tree is double-worked on the quince. The tree is remarkable for vigor, hardihood to cold, and healthfulness; and bears so abundantly that the crop must be thinned to prevent breaking of branches. Souvenir du Congrès owes its origin to François Morel, Lyons, France. M. Morel sowed seeds in 1852, and one of the resultant trees bore fruit in 1863, and was named Souvenir du Congrès.

Tree medium in size and vigor, upright-spreading, open-topped, very productive; branches zigzag, dull reddish-brown, marked by small, raised lenticels. Leaves 1⅞ inches long, 1½ inches wide, roundish-oval, leathery; apex abruptly pointed; margin tipped with very few glands, finely serrate; petiole 1½ inches long, glabrous, tinged with red. Flowers with a disagreeable odor, 1⅛ inches across, pinkish-white as the buds unfold, becoming whitish, in dense clusters, 6 to 8 buds in a cluster. Fruit ripe in September; large, 3 7/16 inches long, 2 11/16 inches wide, quite uniform in size and shape, oblong-acute-pyriform, symmetrical, with unequal sides; stem 1 inch long, short, thick, curved; cavity obtuse, almost lacking, shallow, narrow, russeted, furrowed, often with the stem inserted beneath a pronounced irregular lip; calyx open; lobes separated at the base, narrow, acute; basin wide, obtuse and flaring, furrowed, symmetrical, smooth except for the thick russet covering; color yellow, with a reddish blush on the exposed cheek, covered with nettings of russet and yellow patches; dots numerous, small, russet, conspicuous; flesh white, tinged with yellow, firm, granular, tender, very juicy, sweet, musky; quality good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds long, wide, plump, acute.

SOUVENIR D'ESPÉREN. Downing in 1869 noted this old French pear as one of the best for either amateur or commercial grower, and at that time it was rather widely planted. Now, growers seldom set it. The trees are vigorous, hardy, healthy, and productive, and the fruits are attractive in appearance and good in quality, but neither tree nor fruit rise much above mediocrity, and the variety has no outstanding character to give it individuality. The crop comes in season in December, after which the pears quickly decay. The variety is worth planting only for the sake of greater diversity. Major Espéren, Mechlin Belgium, raised this pear from seed about the middle of the nineteenth century.

Tree medium in size, upright-spreading, dense-topped, slow-growing, productive; trunk and branches medium in thickness and smoothness; branches reddish-brown, marked with very conspicuous but scattering lenticels. Leaves 3 inches long, 1⅝ inches wide; apex abruptly pointed; margin uneven, finely serrate; petiole 2⅝ inches long, tinged red. Flowers open late, showy, 1⅜ inches across, average 7 buds in a cluster. Fruit ripe the last of November and December; above medium to large, 3½ inches long, 2⅝ inches wide, oblong-obovate-pyriform, the surface uneven; stem 1¼ inches long, slender; cavity very obtuse and shallow or lacking, the flesh drawn up about the base of the stem in a lip; calyx partly open, small; lobes separated at the base, short, narrow, acute; basin shallow, narrow, obtuse, wrinkled; skin thick, roughened with russet; color greenish-yellow well mottled and patched with russet, sprinkled with many russet dots and often with russet overspreading nearly the entire surface; dots numerous, russet, small; flesh yellowish, very granular near the center, firm, crisp but tender, juicy, with a pleasant, aromatic, vinous flavor; quality good to very good; core large, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds small, short, plump, acute, light brown.

SUDDUTH. Sudduth has little to recommend it for eastern pear regions, but it is a standard sort in parts of the Mississippi Valley. The characters which give it a place in the pear flora of the region just named are: remarkable freedom from blight; hardiness to cold and heat; capacity to withstand drought; early bearing; and great productiveness. The fruits are neither attractive in appearance nor high in quality—hardly fit for dessert, being but a grade or two better than the disreputable Kieffer. Like those of the Kieffer, however, they do very well for all culinary purposes. The pears do not keep well, as they soften at the center soon after becoming edible. The trees are nearly as hardy as those of the wild crab-apple. The variety is desirable only where hardiness and freedom from blight are prime requisites. Sudduth was introduced about 1895, although the parent tree was at that time fully seventy years old. It originated from

seed planted by Thomas Constant in 1820, in Sangamon County, Illinois.

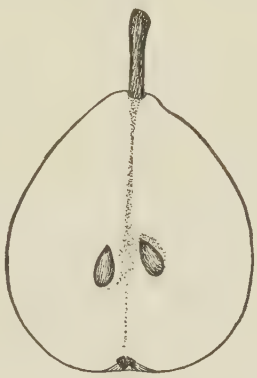
Tree large, vigorous, upright-spreading, open-topped, hardy, productive; trunk stocky, shaggy; branches thick, smooth, dull reddish-brown, sprinkled with numerous large, raised lenticels. Leaves 3 inches long, 1⅝ inches wide, thin, velvety; apex taper-pointed; margin glandless, finely serrate; petiole 2 inches long, slender, tinged red, glabrous. Flowers late, 1⅛ inches across, in dense clusters, average 8 buds in a cluster. Fruit ripe in late September-October; medium or below in size, 2¼ inches long, 2⅜ inches wide, roundish-oblate, slightly conical toward the apex; stem ⅞ inch long, slender; cavity acute, deep, narrow, smooth, sometimes lipped; apex large, open; lobes separated at the base, long, acute; basin very shallow, narrow, obtuse, occasionally wrinkled; skin thin, tough, smooth, dull; color light green, without blush; dots very small, russet or greenish, very obscure; flesh greenish-white, firm, crisp, rather dry, subacid; quality medium to poor; core large, closed, axile, with meeting core-lines; calyx wide, conical; carpels ovate; seeds variable in size, wide, flat, obtuse.

SUMMER DOYENNÉ. The extremely early and highly flavored fruits, which are borne in prodigious quantities, make this a very desirable pear for the home garden. The fruits have no value for the markets as they are small, do not keep well, and are unattractive. The tree is of medium size, comes in bearing early, is hardy, and is as free as most of its orchard associates from blight. Both fruit and foliage suffer badly from pear-scab, and no amount of spraying can give the fruits a fair cheek in season when this fungus is epidemic. Van Mons, the great Belgian pear-breeder, is supposed to have originated this variety; Diel mentioned it among his best pears in 1812.

Tree variable in size, upright, vigorous, productive; trunk slender; branches slender, zigzag, brownish, marked with numerous conspicuous lenticels. Leaves 2⅞ inches long, 1⅛ inches wide, thin, leathery; apex taper-pointed; margin finely serrate; petiole 1¾ inches long, tinged with pink. Flowers showy, 1¼ inches across, in dense clusters, 7 or 9 buds in a cluster. Fruit ripe in early August; small, 1½ inches long, 1⅝ inches wide, obovate-obtuse-pyriform, symmetrical; stem 1⅛ inches long, slender; cavity obtuse, shallow, narrow, slightly furrowed, often lipped; calyx small, closed; lobes separated at the base, short, narrow, acuminate; basin shallow, obtuse, furrowed; skin thin, smooth, tender, waxen, yellow, blushed with bright red, deepening on the exposed cheek to crimson; dots numerous, small, russet, obscure; flesh tinged with yellow, fine-grained, tender and melting, juicy, variable in flavor and quality, pleasantly sprightly under favorable conditions; quality variable, good under the best conditions; core closed, axile, with clasping core-lines; calyx-tube short, narrow, urn-shaped; carpels roundish-ovate; seeds small, narrow, flat, acute.

SUPERFIN: See Beurré Superfin.

TYSON. Fig. 97. Tyson competes with Clapp Favorite as the precursor of the pear season which is really opened by Bartlett. In every character of fruit and tree excepting size and color of fruit, Tyson excels Clapp Favorite. The flesh is melting and juicy with a spicy scented sweetness that gives the fruits the charm of individuality. The pears keep longer and ship better than those of Clapp Favorite, their season in New York being from the middle of August to the middle of September. Unfortunately, the pears are but medium in size, and are often poorly colored. The tree is the most nearly perfect of that of any pear grown in America—the Kieffer, praiseworthy only in its tree, not excepted. It is certainly as hardy as that of any other variety if not hardier, and resists better than that of any other sort the black scourge of blight. Add to



97. Tyson. (×½)

these notable characters, large size, great vigor and fruitfulness, and it is seen that the trees are nearly flawless. Tyson is the best pear of its season for the home orchard, and has much merit for commercial orchards. Were the fruit larger, it would rival Bartlett for the markets. Tyson is a seedling found about 1794 on the land of Jonathan Tyson, Jenkintown, Pennsylvania.

Tree very large, vigorous, upright-spreading, tall, dense-topped, hardy, productive; trunk very stocky, rough; branches thick, dull reddish-brown, with few lenticels. Leaves 2¾ inches long, 1½ inches wide, thin; apex abruptly pointed; margin finely and shallowly serrate; petiole 1⅝ inches long. Flowers medium in season of bloom. Fruit matures in late August; medium in size although somewhat variable, 2⅛ inches long, 1¾ inches wide, roundish-acute-pyriform, with unequal sides; stem 1¾ inches long, curved; cavity very shallow, obtuse, roughened, usually drawing up as a lip about the base of the stem; calyx open; small; lobes separated at the base, short, narrow, acute; basin shallow, narrow, flaring, slightly furrowed, compressed; skin tough, smooth, slightly russeted, dull; color deep yellow, usually without blush; dots numerous, very small, obscure; flesh tinged with yellow, granular around the basin, otherwise rather fine-grained, tender and melting, very juicy, sweet, aromatic; quality very good; core small, closed, with clasping core-lines; calyx-tube short, wide, conical; seeds medium in size and width, plump, acute.

URBANISTE. Urbaniste is desirable for home use because of its highly flavored fruits—so sweet, rich, perfumed, and luscious as to be a natural sweetmeat. The fruits are of but medium size and are not handsome. The flesh is as tender, sweet, juicy, and as delicately perfumed as that of Seckel or White Doyenné, with a distinct flavor and scent which give the fruits the added charm of individuality. The crop ripens in October, in a season when there are many other pears, but the fruits stand comparison with those of any other variety and are welcome additions to the fruit-basket. The trees have several defects, chief of which is

tardiness in coming in bearing, to remedy which grafting on the quince is recommended. They are also somewhat susceptible to blight, and are not as hardy as might be wished. Of all pears, the tree of this is one of the handsomest—clean and tidy, slender and graceful, yet robust and productive. Fruit and tree make this a valuable variety for home plantings. Urbaniste originated as a wilding in the gardens of the religious order of Urbanistes at Mechlin, Belgium, toward the close of the eighteenth century.

Tree medium in size, vigorous, upright-spreading, slow-growing, productive with age; trunk slender, shaggy; branches stocky, shaggy, zigzag, reddish-brown, sprinkled with numerous lenticels. Leaves 2¼ inches long, ⅞ inch wide, thin, leathery; apex taper-pointed; margin finely serrate; petiole 1½ inches long, slender. Fruit ripe in late October and early November; medium in size, 2⅛ inches long, 1⅞ inches wide, obovate-obtuse-pyriform, with unequal sides; stem ⅝ inch long, short, thick; cavity obtuse, shallow, narrow, faintly russeted, furrowed, slightly lipped; calyx open; lobes separated at the base, narrow, obtuse; basin shallow, narrow, obtuse, slightly furrowed; skin thick, tough, roughened by the russet nettings, dull; color pale yellow, often with a faint russet-red blush on the exposed cheek and marked with nettings and patches of russet; dots numerous, small, russet, conspicuous; flesh tinged with yellow, granular especially around the core, tender and melting, buttery, juicy, sweet, pleasantly aromatic; quality very good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds medium in size and width, long, plump, acute.

VERMONT BEAUTY. The fruits of Vermont Beauty elicit praise from all who see or taste them. The bright-cheeked pears are as alluring to the eye as those of any other variety, and they are almost as delectable as the fruits of Seckel which they resemble in shape, but are larger and handsomer. The crop ripens a little later and keeps longer than that of Seckel, and for these reasons, and because of the alluring appearance, should sell better. The pears are used to grace the table for dessert, but the sprightly flavor makes them well suited for all culinary purposes. The trees are preëminent among their kind by virtue of large size, rapidity of growth, productivity, and hardiness, the region from which the variety came as a seedling bespeaking greater hardihood to cold than that possessed by the average variety. They rejoice in vigor and health as do those of almost no other variety, and while hardly as productive as those of Seckel, yet because of larger fruits fill the basket nearly as quickly. Vermont Beauty is one of the best of the pears of its season, and deserves a place in the orchards of the country for home and market. The variety is supposed to have originated in the nursery of Benjamin Macomber, Grand Isle, Vermont, more than forty years ago.

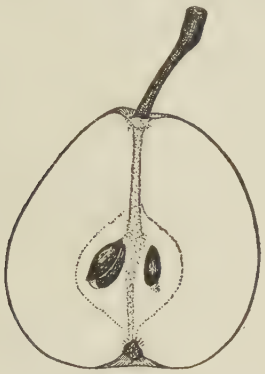
Tree vigorous, upright-spreading, dense-topped, hardy, productive; trunk stocky, shaggy; branches medium in thickness and smoothness, zigzag, reddish-brown, with numerous large, very conspicuous lenticels. Leaves 2¾ inches long, 1⅜ inches wide, leathery; apex abruptly or taper-pointed; margin glandless, finely serrate; petiole 2 inches long, glabrous, slender, pinkish-green. Flowers characteristically small, average 1 inch across, in dense clusters, about 6 buds in a cluster, the petals unusually small. Fruit ripe in late October-November; medium in size, 2½ inches long, 2 inches wide, obovate-acute-pyriform, symmetrical; stem ¾ inch long, curved; cavity small or lacking, the flesh folded around the base of the stem, occasionally lipped; calyx small, open; lobes separated at the base, short, narrow, acute; basin shallow, narrow, obtuse, smooth, symmetrical; skin thick, tough, smooth, or with slight russet markings; color clear pale lemon-yellow, with a broad and brilliantly blushed cheek of pinkish-red, fading at the sides into pinkish-red dots; dots numerous, very small, light russet, conspicuous; flesh tinged with yellow, granular at the center but fine-grained near the skin, tender and melting, very juicy, with a rich vinous flavor; quality very good, core closed, axile, with meeting core-lines; calyx-tube short, wide, conical; seeds large, wide, plump, acute.

VICAR OF WINKFIELD. *Vicar.* The pears of this variety are so variable in quality, often being wretchedly poor, that this sort is now seldom planted in America. The variety is not liked, also, because the trees blight badly. The fruits are large and handsome, keep well, and are excellent for all culinary purposes. They have a strong musky smell, and are more or less astringent, the quality depending largely on the soil, being best when the trees stand in a deep, warm loam. The pears are long-pyriform, usually one-sided, and are further characterized by the peculiarity that the calyx is not in line with the axis as in other pears, but is on one side, generally opposite to that in which the stalk is inserted. The trees, barring susceptibility to blight, are about all that could be desired—large, vigorous, handsome, and thriving both as standards and dwarfs. In 1760 this pear was found as a wilding by a French curate at Villiers-en-Brenne.

Tree large, vigorous, upright-spreading, dense-topped, hardy, very productive, long-lived; trunk and branches stocky; branches zigzag, greenish-brown, with lenticels variable in number and size. Leaves 3 inches long, 2¼ inches wide, thick, leathery; apex abruptly pointed; margin tipped with minute scattering glands, finely serrate; petiole variable in length, pinkish-green. Fruit ripe December-January; large, 3¾ inches long, 2⅝ inches wide, oblong-pyriform, with a long, tapering neck, with unequal sides; stem 1½ inches long, slender, curved; cavity lacking with stem obliquely set and often with a fleshy fold around the base in the form of a lip; calyx large, open; lobes long, obtusely pointed; basin shallow, narrow, obtuse, smooth, symmetrical; skin thick, tough, smooth, dull; color pale yellow, often with a faint brownish-red blush over the exposed cheek, marked with light russet around the calyx, and occasionally with russet flecks scattered over the surface; dots numerous, small, conspicuous, brownish-russet; flesh white, granular only near the center, tender and melting, juicy, astringent or with a sprightly muskiness; good only for cooking; core small, closed, axile, with clasping core-lines; calyx-tube long, narrow, funnel-shaped; carpels long-oval; seeds large, long, often abortive.

WHITE DOYENNÉ. Fig. 98. *Virgalieu.* This ancient and world-renowned pear, its fruits as delectable as any that come from the pear orchard, is now rarely planted in America. It is being discarded because the small and comparatively unattractive fruits fail to satisfy commercial demands. In the middle of the last century, when there was almost a mania for the best European pears, when fruits were judged by the palate rather than the eye as now, White Doyenné was one of the most commonly planted varieties. A more serious fault than small and unattractive pears is that the fruits and foliage are inviting prey to the

scab fungus which often cracks and scabs the pears and defoliates the trees. Except in susceptibility to scab, the trees are nearly flawless when grown in the soil which they prefer—a rich clay which should be heavy rather than light. On such soil, tree and fruit attain perfection. Grown in a light soil, and when scab is unchecked, the fruits are small, green,



98. White Doyenné.

cracked, and cankered—intolerable to sight and taste. Unfortunately, also, the trees are ravaged by blight when that disease is epidemic. The faults named have made the variety an outcast, but it should still receive attention for the superb quality of its fruits where scab and blight can be controlled. This pear is one of the oldest of all varieties. So confused is its identity that it is impossible to state whether the variety originated in France or was brought to that country from Italy.

Tree large, vigorous, upright, vasiform, hardy, very productive; trunk stocky, somewhat smooth; branches thick, dark gray, with many large lenticels. Leaves 2½ inches long, 1¾ inches wide, flattened, leathery; apex taper-pointed; margin finely serrate; petiole 1½ inches long, slender. Flowers early, 1⅛ inches across, in dense clusters, 7 or 8 buds in a cluster. Fruit matures in early October; medium in size, 2¼ inches long, 2⅛ inches wide, uniform, obovate-obtuse-pyriform, symmetrical; stem ¾ inch long, thick, slightly curved; cavity obtuse, shallow, narrow, russeted, usually symmetrical; calyx small, open or closed; lobes short, narrow, obtuse; basin shallow, obtuse, nearly smooth, symmetrical; skin thick, tough, smooth, dull; color clear pale yellow with a small amount of bright red blush on the exposed cheek; dots numerous, small, russet, conspicuous; flesh yellowish-white, granular, firm at first but becoming melting when fully ripe, juicy, sweet, with a rich, aromatic flavor; quality very good; core closed, with clasping core-lines; calyx-tube short, wide, conical; seeds wide, plump, obtuse.

WILDER EARLY. *Early Wilder. Wilder.* This is one of the good, early pears for the markets, more highly prized in the Mississippi Valley than in the eastern states. The pears are very attractive in size, shape, and in the bright lemon-yellow color with a flaming cheek to the sun. The whole pear is characteristically marked with small russet dots set in a pinkish circle. Of all summer pears, the fruits of this one seems least inclined to rot at the center, and usually keep longer and ship better, although the skin is tender and bruises easily. The flesh is buttery, moderately juicy, sweet and rich, with a faint, pleasant perfume. The fruits are small, but are edible almost to the very center, the core being very small. The tree is large, vigorous, prodigiously productive, as healthy as any, and is a remarkably handsome ornamental. Despite this catalog of virtues, Wilder Early is not largely planted, there being small demand for summer pears. Wilder Early is a chance seedling found by Charles A. Green, Rochester, New York, about 1884, in Chautauqua County, New York.

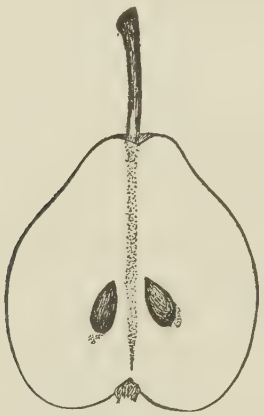
Tree large, vigorous, upright, dense-topped, rapid-growing, hardy, very productive; trunk and branches medium in thickness and smoothness; branches zigzag, reddish-brown, with numerous lenticels. Leaves 3¼ inches long, 1⅞ inches wide, leathery; apex taper-pointed; margin very finely serrate; petiole 2 inches long, glabrous. Flowers 1 3/16 inches across, white or tinged with pink, in dense clusters, average 7 buds in a cluster. Fruit ripe in late August; large, 2⅝ inches long, 2¾ inches wide, oblong-pyriform, symmetrical; stem ¾ inch long, very thick; cavity acute, narrow, russeted and with rays of russet extending over the sides, slightly compressed, rarely lipped; calyx large, open; lobes separated at the base, long, narrow, acuminate; basin very shallow, narrow, obtuse, wrinkled; skin thin, tender, smooth, dull; color pale lemon-yellow with a blush on the exposed cheek, often deepening to dark pink; dots characteristically distinct, very numerous, small, russet or russet-red; flesh white, stringy, tender and melting, buttery, moderately juicy, sweet, faintly aromatic; quality good; core small, closed, with clasping core-lines; calyx-tube long, narrow, conical; seeds long, narrow, acute.

WINTER BARTLETT. Winter Bartlett is heralded from the Pacific Coast as a winter variety bearing fruits similar to those of Bartlett. As the fruits grow in New York, there is a suggestion of Bartlett in the shape, color and flavor, but in size they fall far short. As the variety grows in the East, the name is a misnomer, several other sorts being more like Bartlett than this one. The season is December and January, a time when there are a half-dozen other good pears, and since this one has no outstanding characters, it is doubtful if it will outlive a brief period of probation in eastern orchards. The westerners say that the tree is very resistant to blight. This pear originated at Eugene, Oregon, some time prior to 1880.

Tree large, vigorous, upright, scraggly, open-topped, hardy, productive; branches stocky, smooth, light-brown, with few lenticels. Leaves 3¼ inches long, 1⅜ inches wide, stiff; apex taper-pointed; margin finely serrate; petiole 2¼ inches long. Flowers 1½ inches across, in dense clusters, average 5 buds in a cluster. Fruit ripe in December and January; large, 3 inches long, 2⅜ inches wide, oblong-obovate-pyriform; stem 1 inch long, thick, curved; cavity narrow, shallow, smooth, oblique; calyx small, nearly closed; lobes short; basin small, shallow, irregular; skin uneven in surface; color attractive yellow, splashed with russet and often blushed on the exposed cheek with bright red; dots numerous, small, brownish-russet; flesh yellowish-white, fine-grained, tender, juicy, sweet, pleasant-flavored; quality good to very good; core small, nearly closed, with meeting core-lines; calyx-tube short, wide; seeds large, long, plump, obtuse.

WINTER NELIS. Fig. 99. Winter Nelis is the standard winter pear in the United States. Both fruits and trees possess several

serious faults, but these are outmatched by virtues which make the variety preëminent in its season. The fruits are small, and are often so poorly colored as to be unattractive, but well grown they are sufficiently large for des-

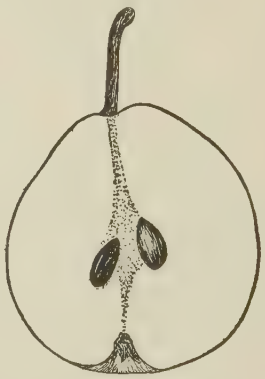


99. Winter Nelis. (×½)

sert fruits, and with their russeted coat and a ruddy cheek are handsome. The flesh is tender, melting, juicy, luscious, with a rich, sweet, aromatic flavor. The fruits keep, ship, and sell well. The season is from Christmas to March, but the pears can be kept until late spring in cold storage. No variety is more difficult to grow well in the nursery, and in the orchard the trees are among the unmanageables. They are small or of but medium size with straggling, wayward tops with habits of growth so self-assertive that no art nor skill of the pruner can bring the branches under control. Notwithstanding the poorly-shaped tops, the trees are often enormously productive. They bear almost annually; come in bearing young; are fairly hardy; and are adapted to almost any soil or situation, provided that the soil is fertile; and are as nearly immune to blight as those of any other European pear. The trees are characterized by two marked peculiarities; the old wood is thickly set with small short spurs; and they are about the latest of all their kind in leafing out in the spring. There is no better winter pear for either the commercial pear-grower or the amateur. Winter Nelis was raised from seed by Jean Charles Nelis, Mechlin, Belgium, early in the nineteenth century.

Tree medium in size and vigor, spreading, hardy, very productive; trunk stocky; branches thick, zigzag, drooping, reddish-brown, marked with small lenticels. Leaves 3 inches long, 1⅛ inches wide, elongated oval, leathery; apex taper-pointed; margin crenate; petiole 1½ inches long, slender. Flowers open late, 1¾ inches across, 6 or 7 buds in a cluster. Fruit ripe November to January; medium in size, 2¼ inches long, 2¼ inches wide, uniform in size and shape, obtuse-obovate-pyriform, symmetrical; stem 1⅜ inches long, thick, curved; cavity obtuse, shallow, narrow, russeted, gently furrowed, occasionally lipped; calyx large, open; lobes separated at the base, short, broad, acute; basin shallow, obtuse, lightly furrowed, symmetrical; skin thick, tender, roughened with russet, dull; color yellow, with many russet streaks and patches, the exposed cheek blushed with light red; dots numerous, small, russet, conspicuous; flesh yellowish-white, granular at the center and underneath the skin, tender and melting, buttery, very juicy, sweet, aromatic; quality very good; core large, closed, axile, with clasping core-lines; calyx-tube short, wide, conical; seeds large, wide, long, plump, acute.

WORDEN SECKEL. Fig. 100. *Worden.* Possibly no pear has been more widely advertised during the last quarter century than Worden Seckel. Nurserymen and pear-growers alike describe it as a better variety than Seckel, and say that it ought to take the place of that sort of which it is a seedling. But it falls short of Seckel in not being quite as dependable in different soils and climates; the trees are not as vigorous, and not as resistant to blight; and the fruits are not as high in quality. On the other hand, the pears are larger and handsomer. Well grown, the fruits of Worden Seckel are voluptuously handsome in form and color. They are smooth, glossy, trim of contour, usually uniform, with a beautifully



100. Worden Seckel. (×½)

blushed cheek on a handsome yellow background. When the crop is thinned so that the fruits attain large size, no pear is handsomer or will bring a higher price on the fruit-stands. The crop comes in with Seckel, but keeps longer. The tree is very hardy and bears young. Commercial growers should give this variety a thorough test, and amateurs everywhere will find it worth planting. Worden Seckel was raised by Sylvester Worden, Minetto, New York, about 1881.

Tree large, vigorous, upright-spreading, rapid-growing, very productive; trunk thick; branches reddish-brown, marked with numerous lenticels. Leaves 2½ inches long, 1½ inches wide, thick, leathery; apex taper-pointed; margin tipped with few minute glands, serrate; petiole 1½ inches long, glabrous, slender, tinged with red. Flowers showy, 1½ inches across, in dense clusters, 8 or 10 buds in a cluster. Fruit ripe in late September-October; medium in size, 2½ inches long, 2⅛ inches wide, obovate-acute-pyriform, symmetrical; stem ¾ inch long, thick; cavity very shallow and obtuse or lacking, the flesh folded up around the base of the stem and often lipped; calyx open, large; lobes narrow, acute; basin shallow, narrow, obtuse, smooth or gently furrowed, symmetrical; skin thin, tender, smooth, glossy; color pale golden-yellow, well blushed on the exposed cheek with solid bright red; dots numerous, small, russet, obscure; flesh yellowish, fine-grained near the skin, granular at the center, tender and melting, buttery, very juicy, spicy and aromatic; quality very good; core closed, axile, with meeting core-lines; calyx-tube conical; carpels ovate; seeds wide, plump, obtuse.

CHAPTER VI

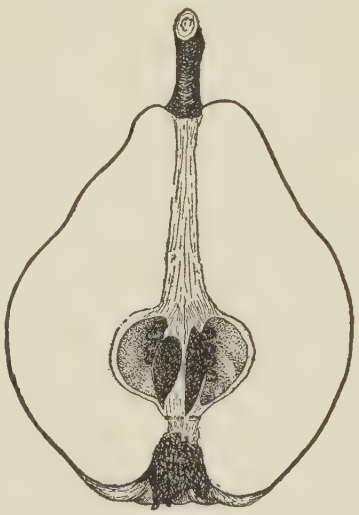
VARIETIES OF QUINCES

The quince, the "golden apple" of the ancients, once dedicated to deities, and looked upon as the emblem of love and happiness, for centuries the favorite pome, is now neglected and the least esteemed of commonly cultivated tree-fruits. Never represented by a great number of named varieties, probably not more than a half-hundred in any country at any one time, the quince is now discarded from many nurserymen's catalogs and appears under two, three, or, at most, a half-dozen names in others. Nineteen varieties are listed in this text, but it is doubtful whether more than ten could be purchased true to name from American nurserymen or be found in the quince plantations of the country. For the most part, the descriptions are compiled.

ANGERS. This variety is seldom or never grown in America for its fruit, but nurserymen import it from France as a stock upon which to dwarf pears. The trees are more vigorous and the leaves larger than those of other quinces. Angers is propagated from cuttings of young wood set in the autumn or from mound-layers. According to French pomologists, the fruit is of value for culinary purposes; the flesh is a little harder than that of other varieties, but becomes tender on cooking. The crop ripens late and is reported to keep longer than that of any other variety.

BENTLY. About 1890, a Mr. Bently, Elba, New York, brought cuttings of a quince from Connecticut, which, upon coming in fruit, bore especially fine quinces. Nelson Bogue, Batavia, New York, thereupon introduced it as a new variety under the name Bently. At the New York Agricultural Experiment Station trees from Mr. Bogue bore fruit identical with Orange. A few nurserymen still list Bently as distinct.

CHAMPION. Fig. 101. Champion is one of the three or four standard varieties of American quinces, having to recommend it the following notable characters: The fruits are very large and handsome, with flesh almost as tender as that of an apple, delicate in taste and odor, which are imparted to any other fruit with which the quinces are cooked. The trees are large and vigorous, bear young, and are very productive. The fruit ripens late and keeps long. In the North, the quinces do not ripen in short seasons, and the color is often too green for best appearance. Champion is of American origin, its history dating back to about 1870.



101. Champion. (×½)

Tree vigorous, productive, early in bearing. Fruit large or very large, obtuse-pyriform, smooth or faintly ribbed; stem set obliquely in a slight depression; basin deep, narrow with deep narrow furrows; color greenish-yellow; pubescence very heavy; core large, open; flesh pale yellow, juicy, but firm, not spongy like that of Orange, slightly astringent, aromatic, mild subacid; quality good.

CHINESE QUINCE. For a description of this quince, offered by some nurserymen as an edible fruit, see *Chœnomeles bagenaria*, page 12.

D'ALGER. This French sort has been listed in American catalogs since 1890, though it is but sparingly grown. In the quince-growing region about Geneva, New York, it has no especial value.

Tree small, rather unproductive. Fruit large, or medium size, subject to a "spot disease," round at the base but drawn out into an acute pyriform neck; faintly ribbed; basin broad, furrowed; stem inserted without depression; color lemon-yellow; much pubescence; flesh light yellow, free from granules, rich, aromatic when cooked, very tender and deep red in color; quality good to best.

DE BOURGEAT. *Borgeat.* Little is known of this quince except that for a quarter of a century it has been listed in the catalogs of several nurserymen. It seems to have been introduced from France about 1885 by J. W. Adams & Co., Springfield, Massachusetts. The following brief description of the variety is recorded at the New York Agricultural Experiment Station:

Tree large, vigorous, healthy. Leaves large. Fruit late, medium in size, round with a short neck, ribbed, regular in outline; stem set obliquely in a very shallow, russeted cavity; basin very broad, abrupt, furrowed, deep; calyx small, open; color greenish-yellow; flesh yellow, juicy, mild subacid; quality good.

DE MAHON. This variety occasionally appeared in American catalogs toward the close of the last century. It seems not to be listed now. In 1907, the fruit was described at Geneva, New York, as having the following characters:

Fruit early or midseason, medium in size, nearly round with a short, thick neck; surface covered with heavy pubescence; bright yellow in color or sometimes greenish-yellow; flesh coarse, rather dry, mild in flavor, aromatic; quality below the average.

ELEPHANT. In Luther Burbank's catalog for 1919 this variety of what is called the Cathay quince is described as follows:

"This enormous new type of fruit is produced in the greatest abundance even on quite young trees and will create a sensation in every market and every home, good specimens being a foot and a half around each way. Smooth bright orange, flesh yellow, turning to a deep pink when cooked. Unlike all others of its class it is superior in quality."

FONTENAY. *Paris.* Fontenay is another quince grown as stock for the pear. The tree is less vigorous than that of Angers and also dwarfs the pears grafted on it. It may be readily distinguished from Angers by its more glabrous shoots, lighter wood, and freedom from the short thorns with which Angers is armed. The trees are further characterized by their very upright growth. The variety is seldom grown for its fruit, which is poorer in quality than that of Angers. The fruits resemble those of the Pear quince in shape and flesh-characters. The variety very readily roots from cuttings.

FULLER. Fuller is probably the best of the early quinces. It is also characterized by the beauty of its fruits, which are rich golden-yellow. Unfortunately, the trees are a little more subject to blight than other varieties, and, since early quinces are not much in demand, are now seldom to be found in commercial plantations. Fuller was discovered about 1868 by A. S. Fuller, Ridgewood, New Jersey, and disseminated by him. The following description is made from trees propagated from the original plant:

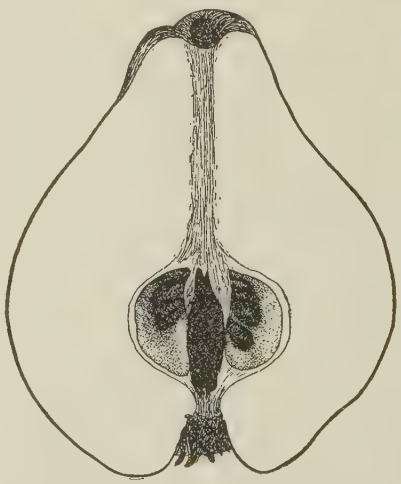
Tree of medium size, lacking in vigor, productive, subject to blight. Fruit very early, medium to large, apple-shaped but with a neck which gives some specimens the pear shape; surface ridged; heavily covered with pubescence; calyx set in a deep, wide basin; stem set in a shallow cavity; flesh light yellow, juicy, tender, free from granules, very aromatic, mildly subacid; quality good to very good.

JAPANESE QUINCE. This is the well-known flowering quince cultivated in all temperate climes for its brilliant flowers, which appear early in the spring. The fruits, however, are used for culinary purposes; the jellies and conserves made from them are most excellent. It belongs to a different species from the true quince, and the reader is referred to *Chœnomeles lagenaria,* page 12, for a fuller description.

JOHNSON. The Johnson quince was more or less grown a quarter century ago in Pennsylvania, where it was thought to surpass the Orange, to which it is very similar but superior in vigor of tree. Also, the plants were said to be less susceptible to quince-blight than the Orange. The variety is still listed by a few nurserymen, but is probably not much grown. It originated with Jacob Johnson, Bucks County, Pennsylvania, about 1875. The following description of the fruit was made in 1908 from specimens sent by the son of the originator to the New York Agricultural Experiment Station:

Fruit ripens with Orange and keeps well; large, round-oblate, with a short, blunt neck, compressed at the stem, faintly ribbed; cavity broad, very shallow; basin large, angular, furrowed, deep; color pale yellow with small green dots; pubescence heavy, the quince becoming smooth at maturity; flesh yellow, juicy, mild, aromatic, fine-grained.

MEECH. Fig. 102. *Meech's Prolific.* Many pomologists believe Meech to be a strain of the better-known Champion. A review of the history and characters of the two varieties



102. Meech. (×½)

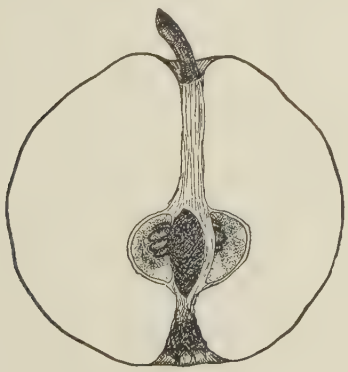
shows that Meech is the older of the two quinces; ripens its crop two weeks earlier; is much less subject to blight; the trees are hardier, more vigorous, and more productive;

and, all in all, the true Meech is a better variety than the true Champion. It would be difficult indeed to make sure now of getting the variety true to name. Meech seems to have been in cultivation in Vineland, New Jersey, about the middle of the nineteenth century. It was not introduced until some years later, when, coming into the hands of Rev. W. W. Meech, it was disseminated in 1883.

Tree very vigorous, hardy, productive and comparatively free from blight; comes in bearing early. Leaves large, broad in proportion to their length and luxuriantly green. Flowers very large and attractive. Fruit midseason, very large, pear-shaped or obscurely pyriform, smooth or occasionally slightly ribbed; stem set obliquely in a slight depression; basin rather narrow, smooth or somewhat furrowed; color bright golden-yellow; very pubescent but becoming smooth at maturity; flesh yellowish-white, juicy, fine-grained, highly aromatic, tart; quality good.

MISSOURI MAMMOTH. About 1875, Missouri Mammoth received the commendation of the Missouri Valley Horticultural Society, and was rather largely planted in Missouri and neighboring states. Its cultivation seems never to have spread throughout the East, but occasionally a plant of the variety is to be found in New York, in which state it ripens with the Orange, but is not so desirable as that variety. In Missouri, the tree was thought to be healthier, more vigorous, and more productive, and to come in bearing earlier than the Orange. The variety seems to have originated in Massachusetts, nearly a century ago, thence it was carried to Ohio, thence to Missouri, where it was introduced soon after the Civil War.

Fruit ripens with the Orange or a little earlier, very large, round or oblong-ovate, ribbed but with the surface smooth; calyx set in a shallow, wrinkled basin; stem short, inserted in a small, moderately deep cavity; core small; color bright lemon-yellow; flesh pale yellow, juicy, slightly astringent, very aromatic; texture fine; quality very good.



103. Orange. (×½)

ORANGE. Fig. 103. *Apple.* Orange is a group rather than a varietal name. Nurserymen and quince-growers are prone to call every orange- or apple-shaped quince "Orange" or "Apple." The type seems to come nearly true from seed, which fact accounts for the several strains. These Orange quinces belong to the North, where they ripen late in the season in cool weather. In the South, they ripen too early, and are inferior in size, quality, and color to several other varieties. The name has long been used, but when or where it was first used is not known. Orange is the leading commercial quince in the United States.

Tree very vigorous, hardy, productive, and as free as any from blight. Fruit early midseason, nearly round with a very short, thick neck, faintly ribbed; cavity broad, very shallow with indications of a small, undeveloped neck, russeted; basin broad, abrupt, deep, furrowed; calyx medium in size; very pubescent; color golden-yellow or sometimes greenish-yellow; flesh pale yellow, tender, fine, juicy, mild subacid, becoming a beautiful dark red when thoroughly cooked; core medium in size, wide open; quality very good.

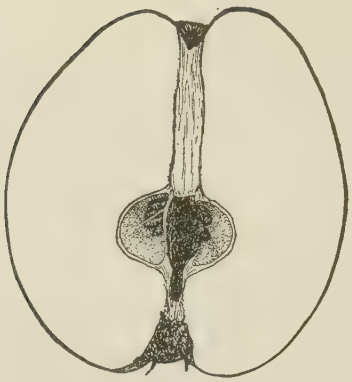
PEAR QUINCE. Pear, like Orange, is the name of a group rather than of a variety. The fruits of the several strains are medium in size rather than large, pyriform, usually colored a duller and richer yellow than the Orange strains, not so well flavored, and ripen later in the season. The Pear quinces are better adapted to southern than northern localities.

PINEAPPLE. Pineapple is a comparatively new variety originated by Luther Burbank and sent out by him in 1899. The originator says that the variety is the result of an effort to secure a quince which upon cooking would become tender as does the flesh of the apple. The flavor, Burbank says, is suggestive of the pineapple, hence the name. In appearance the quince resembles the Orange, but is smoother and more globular, lighter in color, and a little larger. The tree is described as a strong grower and as productive as that of the Orange.

REA. *Rea's Mammoth.* Rea is a strain of the Orange characterized by very large quinces and a strong-growing, productive tree, with foliage a little darker than that of the true Orange. The fruit ripens a little later and keeps well after maturity. The history of the variety goes back to Coxsackie, New York, whence it seems to have been disseminated by Joseph Rea. The trees are tender to cold in the North and, therefore, in disfavor in the quince-growing regions of New York and New England; they are also lacking in vigor, need high culture, and the crop should be thinned.

SMYRNA. This is a new variety introduced from Smyrna in 1897 by G. C. Roeding, Fresno, California. It seems to have found a prominent place in California, but as yet is hardly tested in the East. The plant is a handsome ornamental. The variety is well worth trying.

Tree a rapid and very vigorous grower with many large leaves. Fruit large, round-oblong; surface lightly furrowed, lemon-yellow; season about that of Orange, the fruit keeping well; flesh tender, very aromatic, mild subacid; quality good to very good.



104. Van Deman. (×½)

VAN DEMAN. Fig. 104. Van Deman is a comparatively new candidate for pomological honors from Luther Burbank, Santa Rosa, California. Its value remains to be determined, although it has already found favor in some regions. The variety is described as follows, from trees on the grounds of the New York Agricultural Experiment Station, Geneva, New York:

Tree vigorous, hardy, prolific, coming in bearing early. Fruit ripens just before Orange; very large, pear-shaped, with a short, obtuse neck, making the shape obtuse-pyriform; surface smooth; basin of medium width and depth; stem set obliquely in a shallow calyx, sometimes surrounded by a short, neck-like protuberance; calyx open, with leaf-like lobes; color pale orange; without much pubescence; flesh pale yellow, rather coarse, slightly astringent, aromatic, pleasant, subacid, juicy, becomes deep red when cooked; quality very good; core large, wide open.

WEST MAMMOTH. West Mammoth seems to be a strain of Orange, which it much resembles. It originated with a Mr. West, a pioneer nurseryman of Stockton, California, some time previous to 1880, and is still listed by California nurserymen.

PART II

DRUPE-FRUITS

CHAPTER VII

BOTANY OF THE DRUPE-FRUITS

A drupe is a fruit consisting of a fleshy or leathery, valveless exocarp (the pulp of the peach, plum, cherry and similar fruits) and a hard, bony endocarp (the stone of the fruits named) enclosing a single seed. The drupe-fruits, sometimes called the stone-fruits, are the almond, apricot, cherry, peach, and plum, represented by many species. All belong to the genus Prunus, a member of Rosaceæ, to which family, as we have seen, belong also pomes, brambles, and strawberries. To be able to distinguish the species and their many horticultural varieties, the student must know the gross structure and the habits of growth of the great botanical group constituting the drupe-fruits.

Size and habit of tree.

Species of the stone-fruits have very characteristic trees, a glance usually enabling one to tell one species from another. So, also, many of the varieties of different species are readily told in the orchard by the size and habit of the plant. Size, it must be remembered, responds to environment—food, moisture, light, isolation, pests, and the like—but, making proper allowance, size of tree, or of its parts, is a reliable character by which to determine either species or varieties of the drupe-fruits. There are no true dwarfs in any of the cultivated drupes in America. As with the pomes, the terms *large, small,* and *medium* are used to designate size. Habit of growth is nearly as important as size, and as it is affected but little by environment, becomes a most important means of distinguishing groups. For example, the tree of a species or variety may be upright, spreading, drooping, or round-topped; the top may be open or dense; the branches may form a vase or pyramid; the trunk may be short and stout or long and slender, straight or crooked, smooth or gnarled; the trees may grow rapidly or slowly; and may be long-lived or short-lived. These habits of growth not only help to distinguish varieties, but very largely determine whether the plant is sufficiently manageable to make a good orchard plant.

Hardiness.

The degree of hardiness is most important in classifying drupe-fruits. In the case of the sweet cherry, peach, and plum, varieties tolerate widely varying degrees of cold; in the case of the sour cherry, great differences in heat. In one of the classificatory schemes for the peach, that of Onderdonk and Price, hardiness is the chief determinant of groups. The range in hardiness of varieties falls within that of the wild species, as it is seemingly impossible to develop a variety hardier than the species from which it comes. Varieties of drupe-fruits are designated as *hardy, half-hardy,* and *tender.* In North America, artificial protection is seldom given to tender drupe-fruits, as is often done in Europe, although peaches, apricots, and nectarines are occasionally grown under glass.

Fruit-bearing.

Productiveness, age of bearing, regularity in bearing, and certainty of bearing all count in classifying any of the drupe-fruits, though of much less importance for this purpose than in pome-fruits, since the drupe-fruits usually bear early and are productive and regular in bearing; otherwise they are not chosen for cultivation. The care given trees greatly influences all of these characters, and in using them allowance must be made for culture, as also for soil, climate, light, pests, and other environmental conditions. Length of life must be noted in describing species and varieties, as a characteristic difference.

Resistance to disease.

Susceptibility and immunity to disease and insects are valuable taxonomic characters. There are great differences among varieties of peaches in resistance to the yellows, little-peach, and leaf-curl; in plums, to brown-rot and black-knot; in cherries, to leaf-spot and gummosis; and in all drupe fruits to San José scale, borers, and plant-lice. Resistance to pests, obviously, is of great economic importance, and the reactions of varieties to pests, so far as they can be determined, should always be stated in a description of a fruit, whether or not they may be used in classification. Both insects and fungi may vary in destructiveness from year to year and, no doubt, the host-plant may acquire new relationships to either insect or fungous pests.

Bark.

The thickness, smoothness, and manner of exfoliation of the bark have great value in determining species of drupe-fruits, but are of little use in distinguishing varieties. Any one of the ten or twelve species of cultivated plums can be recognized by the characters of the bark. Color of bark, both the outer and the

inner, helps materially to identify all species of drupe-fruits, and is a means of recognizing many varieties. Bark is usually lighter in color in warm than in cold climates; in dry than in wet regions. On young trees, the bark is smoother and brighter than on old, as it is also in healthy, vigorous specimens.

Branches and branchlets.

The branches and branchlets of both species and varieties are very characteristic. The length, thickness, rigidity, branching angle, and direction are all very characteristic and change but little with variations in soil and climate. The branchlets may be short or slender; long-jointed or short-jointed; straight or zigzagging; variously colored; those of some species or varieties are pubescent at one stage or another, while those of others are glabrous at all stages of growth. It is of much importance with the drupes whether they are armed or unarmed with thorns or spurs, nearly all species being armed. In particular, the character of the spurs is important in identifying some of the native plums. The length of the internodes and the shape of the nodes are important characters. Although exceedingly variable, the presence and amount of pubescence, and the size, color and number of lenticels on young wood are important in distinguishing botanical and horticultural groups. The color of the wood is also of taxonomic importance. The presence or absence of excrescences is always to be noted, since some plums may be so identified.

Leaf- and fruit-buds.

Both leaf-buds and fruit-buds are of much value in separating species, and may often be used in distinguishing varieties. Thus, fruit-buds are borne in pairs with a leaf-bud separating the members of the pair on peach wood; flower-buds are borne in triplets in Japanese plums; and in other species may be borne singly, in pairs, or in rosettes. Size, shape, color, position, and angle must all be taken into account. The outer and inner scales and the margins of the scales vary greatly, and so offer stable differences in different species. Vernation, or the disposition of the leaf-blade in the bud, is a fine mark of distinction in separating cherries from other drupe-fruits; and, while all cherries are supposed to be conduplicate (folded on the midrib so that the two halves are face to face), yet there are important differences as to the manner of conduplication in both species and varieties. Leaves of plums are usually convolute (rolled up in the bud), but in a few species they are conduplicate, an indication of the close relationship of cherries and plums.

Leaves.

After the fruits, leaves are the most useful organs as determinants of both species and varieties. Leaves vary but little and only under easily recognized conditions; as, in young plants, on water-sprouts, and in extremes of soil, light, moisture, and temperature. Only leaves found on normal wood should be studied. Leaf-size is the most variable character of leaves, yet it serves to distinguish varieties in every species of drupe-fruits; size should be designated by figures. Leaf-form is the most stable leaf-character, hence especially valuable in classification. The bases and apices of leaves usually afford valuable distinguishing marks of the drupe-fruits. The time of appearance and the time of dropping are important in distinguishing any of the drupes. The margins of leaves in all species in this group of fruits are very characteristic, and often serve to identify varieties as well. In studying margins, both serrations and glands are most constant in the middle of the sides of leaves, those at the base and apex often being crowded or wanting. In the drupe-fruits the margins may be serrate, crenate, toothed, doubly or singly divided, glandular or glandless, never entire. Margins of leaves of the drupe-fruits are sometimes more or less hairy. The color of leaves is very constant in species and varieties, when studied in individuals or taken in mass. Nearly all species and many varieties are given a distinct aspect by their summer dress, which is chiefly dependent on the color of the leaves, that of both upper and lower surfaces being constant. Pubescence, texture, thickness, and the reticulation of leaves must be taken into account in determining species, but are of small value in naming varieties, although all are variable in accordance with age of leaf, and the soil and climate in which the plant grows. The petiole may be used to good advantage in determining species and varieties. Thus, in consequence of the great length and slenderness of the petiole in sweet cherries, the leaves droop, while because of the short, stout leaves of sour cherries, the leaves are usually erect. The color of the petiole of the leaf in some stone-fruits is correlated with that of the fruit. Pubescence must be noted. Stipules offer little evidence of value in any of the drupe-fruits except in the cherry, with which fruit they have considerable value in separating even closely related varieties. Stipules appearing with the first leaves of the cherry are small and drop before the fruit ripens; stipules appearing with later leaves are large, borne in pairs, and remain until fruiting is past; the season of dropping depends much on the variety. Stipules of cherries are usually deeply toothed and bear glands of varying color and shape which are characteristic. Many of the distinguishing marks mentioned under leaves apply to stipules.

Leaf-glands.

Much use is made of the glands on leaf-stalks in classifying peaches. Their presence or absence, size, color, position, shape, and number must be noted, and whether stalked or sessile. Two kinds may be found; globose, those which are small globes; and reniform, those which are kidney-shaped. In studying

Plate V.—Napoleon Cherry.

glands, examination must be made several times during the season, the most characteristic ones being found toward the end of the summer. Varieties of the peach with glandless leaves are reputed to be most susceptible to mildew; and, on the other hand, are said to be most resistant to leaf-curl. A century ago, European pomologists made several classificatory schemes for the peach founded on the glands; these are now discarded, the glands proving too variable. Glands on the leaf-stalks of other drupes than peach and apricot are of small value in classification, but should usually be noted.

Flowers.

The flowers of all drupes are very characteristic and help to delineate species and varieties. They differ in time of appearing; in length of season; in size and color; in length of pedicel; and both the floral and reproductive organs give distinctions to botanical and horticultural groups. In some species, as in the plums, the reproductive organs differ greatly in ability to perform their functions, many varieties being more or less self-sterile. The season of flowering is a fine mark of distinction with all drupe-fruits. A well-marked correlation between the color of the inside of the calyx-cup and the color of the flesh of the fruit is one of the distinguishing marks of the peach; yellow-fleshed peaches develop from the blossoms in which the inside of the calyx-cup is orange; white-fleshed peaches from those in which the calyx-cup is green on the inside. The fragrance of flowers in different species and varieties varies greatly and the character is constant. Many varieties of drupes may be recognized by the distribution of the flowers on the tree, since some bear their flowers on the ends of branches, while others produce them on spurs and branchlets well down on the branchlets. There are many flowers in the flower-clusters of some drupes; in others, few. In some varieties, the flowers are loosely arranged; in others, compactly.

Fruits.

The best characters by which to make identifications of drupes are in the ripened fruits. Thus, depending upon size; upon whether smooth- or hairy-skinned, free- or clingstone, yellow-, white- or red-fleshed; as to whether the color is red, yellow or green; as to what the shape; most of the drupes may be easily identified. Following these major characters, many minor ones, as those having to do with quality and season, play an important part. The color of the juice is a certain dividing-line in cherries. Bloom, skin, cavity, apex, stem, and suture are among the minor characters. The terms used in describing size in pomes are also used with drupes. The shapes of drupes are simpler than those of pomes, and the descriptive terms are so easily understood as to need no discussion here. The stem is much used in identifying all drupe-fruits. Its presence or absence is a definite distinguishing mark with some species, while length is an almost certain mark of identification of some cherries and plums. Thickness is of small importance, but color is often distinctive. The stems of some drupes are characteristically enlarged at the end, and in some they are more or less curved. The ease with which the stem parts from fruit or tree is sometimes characteristic. The cavity is described by the terms used in describing the cavity in pomes, but the apex, occupying the place of the basin in a pome-fruit, has special terms of description. It may be raised or sunken, rounded or tipped; the tip may be blunt, sharp, mucronate, or mammiform; the remains of the calyx may drop or be more or less persistent. The stones aid in determining species and sometimes assist in recognizing varieties. They differ in size, shape, grooves, ridges, in the pitting, and in the characteristics of base and apex. In plums and peaches, the stones of the freestones are more deeply furrowed and the sides are smoother than those of clingstones. Apricots may be divided into two groups; those with bitter kernels and those with sweet kernels. Still another division of apricots may be made from a difference in the dorsal suture; in some apricots this suture is pervious, in others, impervious. What has been said of the flesh, flavor, and quality of pome-fruits applies also to drupe-fruits. Not that these characters are similar in the two groups, but the same method of characterization and much the same language are employed for the two.

The accompanying description blank for the peach sets forth most of the characters students and fruit-growers will use in describing drupe-fruits.

DESCRIPTION BLANK FOR THE PEACH

Name .....Orchard..... Row..... No..... Date..... 19....

TREE

Marked characteristics.....
Large, medium, small
Vigorous, medium, weak
Upright, spreading, drooping
Dense, open
Vase-formed, round-topped
Hardy, half-hardy, tender
Very productive, productive
Medium productive, unproductive
Regular bearer, uncertain bearer

SUSCEPTIBILITY to
Insects .....
Diseases .....

TRUNK
Stocky, medium, slender
Smooth, medium, shaggy

BRANCHES
Stocky, medium, slender
Smooth, medium
Shaggy, zigzag
Red, brown, gray
Green, glossy, dull

Lenticels
Numerous, medium, few
Large, medium, small

BRANCHLETS
Thick, medium
Slender, willowy
Long, medium, short

Internodes
Long, medium, short

Bark
Red, brown, gray
Green, glossy, dull
Rough, smooth, zigzag
Pubescent, glabrous

Lenticels
Numerous, medium, few
Large, medium, small
Raised or not

LEAVES
Length..... Width.....
Large, medium, small
Oval, ovate, obovate
Acuminate, lanceolate, spatulate
Abruptly pointed, acutely pointed
Thick, medium, thin
Light, medium, dark green
Smooth, rugose

Margin
Glandular, crenate
Finely serrate, coarsely serrate

Petiole
Long, medium, short
Thick, medium, slender

Glands
Average number .....
Opposite, alternate
Large, medium, small
Globose, reniform, mixed
Red, green
Position .....

Stipules .....

FLOWER-BUDS
Hardy, half-hardy, tender
Large, medium, small
Long, medium, short
Obtuse, conic, pointed, plump
Appressed, free
Pubescent

FLOWERS
Date of bloom .....
Early, medium, late
Inches across .....
Large, medium, small
Pink, salmon

FRUIT

Marked characteristics .....
Early, midseason, late

DATE OF RIPENING .....

KEEPING QUALITY .....

SHIPPING QUALITY .....

SUSCEPTIBILITY to
Insects .....
Diseases .....

Length..... Greatest diameter.....
Large, medium, small
Regular, irregular
Oval, ovate, roundish
Oblate, cordate, oblong
Truncate, conical
Compressed long or opposite sutures
Halves equal or unequal

CAVITY
Deep, medium, shallow
Wide, medium, narrow
Regular, irregular
Flaring, abrupt

SUTURE
Shallow, medium, deep
Distinct, indistinct
A mere line, lacking

APEX
Prolonged tip, short tip
Roundish, flattened, depressed

COLOR
Red, yellow, green
Crimson, white
Mottled, blushed, striped

PUBESCENCE long, medium, short
Thick, medium, thin

SKIN
Thick, medium, thin
Tough, medium, tender
Adherent, semi-free, free

FLESH
Red, white, green, yellow
Juicy, medium, rather dry
Coarse, fine-grained, stringy
Tough, medium, tender
Firm, melting
Ripens evenly, unevenly
Sweet, subacid
Sour, sprightly, aromatic

Quality
Best, very good, good
Fair, poor, very poor

STONE
Free, semi-cling, cling
Length..... Greatest diameter. .....
Large, medium, small
Ovate, roundish, flattened
Obovate, oval, plump
Conspicuously winged, grooved
Pointed, blunt, oblique
Smooth, corrugated, pitted

USE
Dessert, kitchen
Market, home

DESIRABILITY

REMARKS .....
.....

THE GENUS PRUNUS

Here belong almonds, apricots, cherries, nectarines, peaches, and plums, constituting a genus that contains a greater number of distinct, natural esculents than any other similar botanical group. There are in the genus some forty odd species of edible fruits, which, through long cultivation, have been broken up into many orchard-varieties. The distinguishing characters of Prunus are:

Trees or shrubs with astringent properties. Leaves conduplicate or convolute in the bud, alternate, simple, serrate, petiolate, deciduous or persistent; stipules free from the petiole, lanceolate, glandular, deciduous. Flowers solitary, in corymbs or racemes, appearing from separate buds before, with, or after the leaves; calyx five-lobed; tube obconic or tubular, deciduous; stamens 15 to 20, inserted with the petals in three rows; pistils with one carpel or rarely with two or more carpels; ovary inserted in the bottom of the calyx-tube, one-celled. Fruit a drupe, with a glaucous or pubescent outer covering, a pulpy, dry or leathery flesh covering, a bony, smooth or rugose pit or stone which is one- or rarely two-seeded.

Nearly every botanist who has worked with Prunus has grouped the stone-fruits according to a plan of his own, and there are, therefore, many schemes of classification, and consequently much confusion in the nomenclature of this genus. Happily, these differences made by botanists need not confuse pomologists, for each of the stone-fruits constitutes a distinct pomological group. No fruit-grower could mistake in tree or fruit the peach, plum, cherry, apricot, or almond. For the purpose of this manual, one of the oldest, but still most commonly used classifications is accepted, in which all of the drupe-fruits are placed in one genus. The lines of cleavage between the several groups of common culture are easily distinguished, there being four distinct subgenera.

1. *Amygdalus.* Peach and Nectarine. Leaves conduplicate in vernation. Flowers solitary, sessile or nearly so, appearing before the leaves. Fruit pubescent in the peach, smooth in the nectarine; the flesh thick and succulent (dry and leathery in the almond which belongs to this group); the stone compressed, thick-walled, rugose and deeply pitted.

2. *Armeniaca.* Apricot. Leaves conduplicate in vernation. Flowers solitary, with short pedicels, appearing before the leaves. Fruit pubescent, with succulent flesh and a thick-walled conspicuously winged smooth or pitted stone; peduncle separating from the mature fruit.

3. *Prunophora.* Plum. Leaves conduplicate or convolute in vernation. Flowers with pedicels, borne in cymes, appearing before the leaves. Fruit smooth, succulent, often covered with a glaucous bloom; stone compressed, smooth or slightly rugose, grooved on the dorsal and acute-margined on the ventral suture; peduncle slender, usually remaining with the fruit.

4. *Cerasus.* Cherry. Leaves conduplicate in vernation. Flowers with pedicels, borne in fascicles or corymbs, appearing before or with the leaves. Fruits globular, not sulcate, glabrous, not glaucous, smooth, or rarely slightly hairy; flesh succulent; stones turgid, nearly globular, smooth or slightly rugose, ridged on the ventral suture.

THE PEACH AND NECTARINE

1. *Prunus Persica,* Stokes. Tree low, diffuse; bark dark reddish-brown, in old trees rough and scaly; branches spreading, slender; twigs slender, glabrous, glossy green changing to shades of red, with numerous, conspicuous lenticels. Leaves alternate, simple, 4-7 inches long, 1-2 inches wide, oblong-lanceolate; upper surface pale, with little or no pubescence; apex long-tapering, base acute or abrupt; margins serrate or crenate, tipped with glands or glandless; petioles ¼-1 inch long, grooved, glandless or with 1-8 globose or reniform glands. Flowers from wood of the previous season; flower-buds plump, conical, free or appressed, appearing before the leaves; flowers of two sizes, the smaller size ranging under 1 inch in diameter, the larger, 1½ inches; the floral color pure white, pink, or red; pedicels very short, glabrous, green. Fruit sub-globular; suture usually distinct; cavity well marked, abrupt; apex with a mamelon or mucronate tip; color varying from greenish-white to orange-yellow, usually with a red cheek, sometimes covered with red; very pubescent except in the nectarine; skin adherent or free from the pulp; flesh greenish-white or yellowish, often stained with red at the pit, occasionally red, sweet or acidulous, aromatic; stone free or clinging, elliptic or ovoid, compressed, pointed; outer surfaces wrinkled and pitted, inner surfaces polished; ventral and dorsal sutures grooved or furrowed, sometimes winged; the seed almond-like, aromatic, bitter.

The name of this fruit has brought about a misunderstanding as to its origin. The word "peach" and most of its equivalents in the countries of Europe are derived from "Persia." This has given rise to the supposition that the fruit originated in Persia; in fact, it is so stated by all the ancient Roman authors who mention the peach. The peach, however, comes from eastern Asia, where it is now found wild, and where Chinese records show that it was cultivated long before there were records of it in Persia or in southern Europe; it was grown in China 2000 years before its introduction into Europe. Some have believed that the peach is but a modified almond, but in the light of recent botanical and historical evidence this theory finds little support.

The species is usually divided by botanists, who name several botanical varieties. Two of these are edible fruits, the nectarine and the Peento peach. But these two botanical varieties, originating again and again in the case of the nectarine as a bud or seed mutation, and in the case of the Peento peach probably having originated as a mutation, are not more distinct from the parent species than the red-fleshed, the Snowball peach, the Yellow Transvaals from South Africa, the nippled peach, the cleft peach, the beaked peach, the winter peaches of China, or the pot-grown dwarfs from China; in fact, the nectarine and the flat peach are no more different from pubescent and globular peaches than the clingstone is from the freestone, the yellow-fleshed from the white-fleshed variety, or the large-flowered from the small-flowered sorts. All may as well be considered pomological groups; all are becoming interminably confused by hybridization.

Few other fruits are found under such varied conditions and over such extended areas as the peach. Once a wild inhabitant of China, it is now cultivated in every part of that vast Empire where agriculture is an industry; the trees are so abundant and so at home in the orchards and forests of Turkestan and Persia as to have given rise to the belief that they have always grown there. Peaches thrive in all parts of southern Europe, and are grown in pots and on walls in northern European lati-

tudes. Coming to America soon after Columbus discovered the New World, the peach found such congenial surroundings that it spread rapidly and widely, leading botanists three centuries later to call it a native. In the fruit areas of the United States, after two centuries of cultivation, the peach is so plentiful that it is to be found fresh, canned, or evaporated in every home in the land, and the species is represented in American orchards by over 1000 varieties which have originated in this country.

European settlers took the peach across the Equator in their migrations, and have made it a favorite fruit in the gardens and orchards of the South Temperate Zone. It is common in the colonies of South Africa; Darwin in his famous voyage to South America found a part of Argentina "thickly clothed with peach and orange trees"; it grows wild on the temperate and subtropic coasts in Chile, Peru, and Bolivia, where it is also an important orchard plant. In temperate Oceanica, New Zealand, and Australia, the peach plays an important part in horticulture.

In its world-wide wanderings, the peach in tree and fruit has taken on most interesting combinations of characters not found in the original. Round, flat, beaked; free or clingstone peaches; with smooth or downy skin; having red, yellow or white flesh; sweet, sour or bitter;—all combinations of these characters are known to American growers of this fruit, but there are varieties of less well-known characters. Thus, the peach in China bears fruits weighing a pound apiece and having extraordinary keeping and shipping qualities; a Chinese peach of the Honey type has a tree with a maximum height of only seven or eight feet; still another Chinese variety has extraordinarily long leaves; another variety from China is a white-stoned sort; a well-known peach in the French West Indies has fruits that peel easily and withstand a continued temperature in the ripening season of 76 to 90 degrees; in Kashgar, a peach is reported that will keep for several months; in Chinese Turkestan there is a nectarine said to keep for several weeks after fully ripe; even more remarkable is the Feichen peach from China which ripens in late September, and can be kept wrapped in paper until February; as remarkable as any is the Transvaal Yellow of South Africa which grows among granite boulders, as a hedge around homesteads, or beside water furrows and dams with the roots in water; the fragrant peach and the firm peach from China are not yet known in America; nor is the Chinese dwarf peach, grown in pots indoors, which fruits at the height of fifteen inches and bears peaches on the main trunk, though the stem is scarcely larger than a lead pencil.

The facts just stated imply two important things to peach-growers. First, the peach is an exceedingly variable fruit which is capable of being moulded to fit many conditions of environment; and which, under cultivation in unlike regions, soils, and climates, may still be greatly improved by crossing and selecting. Second, the peach has seemingly, in centuries of cultivation by the Orientals, taken on sufficient immutability to make it one of the most stable of species. The many races and thousands of varieties are all best put in one species. Many varieties come true to seed; peaches from seed seldom revert to worthless forms, as so many seedling fruits habitually do.

American pomologists loosely divide peaches into four groups or races. First, the Persian race brought to America by the early settlers, best represented by the Crawfords. Second, the North China race made up of varieties characterized by fruits of large size, great beauty, tender skin and flesh, and vigorous trees which bear abundantly and regularly; Chinese cling and Chinese free, early varieties of this race, are still as good representatives of it as any. Third, the South China race represented by varieties which bear small, oval, yellow fleshed fruits with a peculiar honey-sweet flavor; from the flavor, this race is sometimes called the Honey peach. It is adapted only to subtropical parts of America. Fourth, the Peento race, represented by trees which are inclined to be evergreen and by fruits which are sub-globose or much flattened endwise, skin white and mottled with carmine, flesh white or yellow, and the flavor sweet with a peculiar almond taste; the stone in the flattened peaches is also flattened endwise and is either free or cling. The Peentos grow only in subtropical regions. It is now useless to try to keep these several races distinct. All have been and are being freely hybridized, producing offspring which connect the groups.

Nectarines.

The nectarine is a hairless peach. The trees differ in no respect from those of the peach, and, apart from the absence of pubescence, the only distinguishing marks between the fruits are smaller size, firmer flesh, greater aroma, and a distinct and richer flavor in nectarines. The varieties of the two fruits correspond in characters. In both the peach and the nectarine there are clingstone and freestone sorts; both have varieties with red, yellow, or white flesh; the flowers of both may be large or small; nectarine leaves in one variety or another show all the variations in glands and serrations known to the peach; the stone and kernels are indistinguishable in the two fruits; peaches and nectarines are adapted to the same soils and climatic conditions, and, wherever the peach is grown, the nectarine is found. The history of the nectarine goes back over 2000 years, merging into that of the peach.

Three species of Prunus are known as apricots: *Armeniaca,* the common apricot; *Mume,* the Japanese apricot; and *dasycarpa,* the black apricot. The apricot-plum, *Simonii,* is more closely allied to the plums and is classified with plums.

1. *Prunus Armeniaca,* Linn. Common Apricot. Tree small, with a round, spreading top and in color of bark resembling the peach. Leaves round-ovate, thin; margins finely serrate; teeth obtuse; upper surface smooth, bright green; lower surface smooth or nearly so; petioles ½-1 inch long, with one to several glands. Flowers light pink, 1 inch across, borne singly, nearly sessile, opening before the leaves. Fruits earlier than those of the peach or plum; variable in size and shape, smaller than those of the peach, usually compressed; pubescence fine and short or nearly lacking; yellow with more or less red; flesh yellow, sometimes tinged with red, firm, dry, sweet and rich; stone clinging or free, obovate, flat, smooth, ridged or sulcate on one suture.

This apricot is an intermediate between the peach and the plum. The three fruits may be readily intergrafted, and the apricot and plum have been hybridized, the hybrid being called the plumcot, while a supposed hybrid between the peach and apricot is called the peach-apricot. Evolution in the fruit seems to progress from the plum, a smooth fruit, to the woolly apricot and then to the still more velvety peach. The flowers of the apricot are more like those of the plum, being usually white or whitish; and the stone, like that of the plum, is smooth or nearly so. The dorsal suture of the stone in some apricots is soft and pervious, a character not found in peaches or plums. The blossoms appear earlier than those of either peach or plum, and the fruits ripen earlier. The apricot is like the peach in shape and color of the fruits, but has a richer, yellower flesh, somewhat too lacking in juice for most palates. The trees have the round-headed, spreading tops of the peach, and bark like that of the peach. The leaves are broad, almost circular, more or less cordate, smooth and shining, easily distinguished from those of the peach or plum. The kernels of some apricots are sweet, of others bitter.

The apricot is popular in America only in California, and in a few favored spots in the Rocky Mountains and westward. Farther east, the crop is destroyed by spring frosts too frequently to make apricot-growing a safe venture. Moreover, the curculio takes too great toll unless combated by rather expensive treatments. Also, the fruit and its requirements are little known in the East. California has a monopoly of commercial apricot-growing for the world, at least nowhere else does the industry attain so great importance. The fruits are preëminently well adapted to canning and evaporating, and California seems to have captured the trade in apricots so conserved, an industry which requires more than three million trees. Apricots are grown in a small way, however, wherever peaches thrive.

The common apricot grows spontaneously over a wide area in western and central Asia and as far eastward as Pekin, China. Alexander the Great is said to have brought the apricot from Asia to Greece, from which country it was carried to Italy, being first mentioned as a Roman fruit by Pliny in the time of Christ. From Italy, its culture spread slowly northward in Europe, reaching England about the middle of the fourteenth century. There seems to be no mention of the apricot in North America earlier than 1720, when it was said to be growing abundantly in Virginia. In 1792, Vancouver saw apricots growing in the mission orchards of California. Commercial plantations were not made in this state until the early part of the last half of the last century. There are many varieties.

The Russian apricot is a strain of the common apricot, although it is thought by some to be a distinct species to which the name *sibirica* has been given. This race differs from the type apricots in having a narrower and darker colored fruit, and in bearing smaller and poorer fruits. They are supposed to be hardier than the common apricots, but on the grounds of the New York Agricultural Experiment Station, Geneva, New York, they have not proved hardier. The blossoms come out quite as early as do those of other apricots and are as often caught by frost. The Russian sorts are unique in manner of fruit-bearing—the small, round, handsome fruits hang in clusters or ropes on the fruit-bearing branches. This race was introduced in the Middle West by the Russian Mennonites soon after the middle of the last century.

2. *Prunus Mume,* Sieb. & Zucc. Japanese Apricot. Tree small, round, spreading, in shape and size resembling the common apricot, but with bark grayish green and green branchlets. Leaves smaller and duller than those of the common apricot, duller in color, narrower and long-pointed; lower surface pubescent on the veins; petiole short, ½ inch, pubescent, glandular; margin finely serrate; teeth obtuse. Flowers large, handsome, fragrant, sessile. Fruits small, round, yellow or greenish; flesh firm, dry; poor in quality; stone clinging tightly to the flesh, small, ovate, pitted.

The Japanese apricot is grown as an ornamental rather than for its fruit. Two or three varieties are cultivated in the United States for their small yellow fruits, which are so poor in quality, however, that they have little value except as they add variety. This species is more tender to cold than the other two, and the blossoms open so early that there is not much certainty of success in its culture north of citrus-fruit regions, though occasional crops are produced as far north as Geneva, New York. The Japanese grow many varieties, gathering the fruits while green for pickling in a salt solution. But even in Japan, these apricots are grown for their flowers, the fruits being of secondary importance.

3. *Prunus dasycarpa,* Ehrh. Black Apricot. Tree a little larger and more upright than that of the common apricot or of the peach. Leaves long-ovate, thin, dull green; margins finely serrate; petiole usually glandless. Flowers large, showy; pedicel long. Fruit small, round, smooth, plum-like; stem adhering, dark purple or nearly black; flesh soft, subacid; juicy, poor; stone small, ovate, fuzzy, clinging to the flesh; kernel sweet.

The black apricot is wild and cultivated in Manchuria, Kashmir, Afghanistan, and Beluchistan. The tree has long been cultivated in Europe and the United States, but the fruit is small, unattractive in color, and poor in quality. The species is grown only in horticultural collections. In tree and fruit, the black apricot shows close relationship to the plum, its fruits being easily mistaken for dark-colored, round plums. The tree is rather

hardier than that of the peach. There are no named varieties.

THE PLUM

Cultivated varieties of thirteen species of plums are found in American orchards. The names and relationships of these species are shown in the following conspectus.

CONSPECTUS OF SPECIES OF PLUMS

A. Flowers in clusters of 1 or 2. (Three in *P. salicina.*) Old World plums.
  B. Leaves drooping.
    C. Shoots and pedicels pubescent.
      D. Flowers mostly in twos.
        E. Fruit large, more than I inch in diameter, variable in shape ..... 1. *P. domestica.*
        E.E. Fruits small, less than 1 inch in diameter, oval or ovoid..... 2. *P. insititia.*
    C.C. Shoots glabrous or soon becoming so, pedicels glabrous.
      D. Flowers single; leaves hairy along the midrib on the under side..... 3. *P. cerasifera.*
      D.D. Flowers in threes; leaves glabrous. 4. *P. salicina.*
  B.B. Leaves upright, peach-like, glabrous, veins very conspicuous, under side barbate at axils of veins; separated from other plums by the large, flattened, brick-red fruits..... 5. *P. Simonii.*
A.A. Flowers in clusters of 3 or more. American plums.
  B. Plants trees. (*P. angustifolia* rarely a tree.)
    C. Leaves broad, mostly ovate or obovate.
      D. Leaves long-ovate or long-obovate.
        E. Flowers white.
          F. Leaf-serrations glandless, acute; petiole usually glandless; stone turgid, large, pointed at the apex..... 6. *P. americana.*
          F.F. Leaf-serrations, glandular, wavy-crenate; petioles glandular; stone turgid, small, prolonged at the ends..... 7. *P. hortulana.*
        E.E. Flowers fading to pink. Leaf-serrations coarse, rounded, glandular only when young; petioles bi-glandular; stone flat, large. 8. *P. nigra.*
      D.D. Leaves round-ovate, obtusely, sometimes doubly serrate; stone turgid, pointed at both ends. 9. *P. subcordata.*
    C.C. Leaves narrow, Lanceolate-ovate, folded upward.
      D. Fruits small, ½ inch in diameter, cherry-like; petiole bi-glandular; stone small, ovoid, turgid, cherry-like; rarely a tree; tender. 10. *P. angustifolia.*
      D.D. Fruits large, 1 inch in diameter, plum-like; petioles with from 1 to 6 glands; stone compressed and pointed at both ends; usually a tree; hardy.....11. *P. Munsoniana.*
  B.B. Plants shrubs.
    C. Fruits dark purple; stones pointed at both ends. 12. *P. maritima.*
    C.C. Fruits red, orange or yellow but never purple; stone oval, flattened.....13. *P. orthosepala.*

Domestica Plums

1. *Prunus domestica,* Linn. Tree vigorous, open-headed, round-topped; trunk attaining 1 foot or more in diameter; bark thick, ashy-gray with a tinge of red, nearly smooth or roughened with transverse lines. Leaves large, obovate, elliptical, thick and firm in texture; upper surface dull green, rugose, glabrous or nearly so, the lower one paler with little or much tomentum, much reticulated; margins coarsely and irregularly crenate or serrate, often doubly so; teeth usually glandular; petioles ½ inch in length, stout, pubescent, tinged with red; glands usually 2, often lacking, sometimes several, globose, greenish-yellow. Flowers appearing after or with the leaves, showy, 1 inch or more across, white; borne on lateral spurs or sometimes from lateral buds on one-year-old wood, 1 or 2 from a bud in a more or less fascicled umbel; pedicels ½ inch or more in length, stout, green. Fruit globular or sulcate, often necked, blue, red or yellow; stem ½ inch or more long, stout, pubescent; cavity shallow and narrow; apex variable, usually rounded; suture prominent, a line or indistinct; dots small, numerous, inconspicuous; flesh yellowish, firm, sweet or acid and of many flavors; stone free or clinging, oval, flattened, blunt, pointed or necked, roughened or pitted; walls thick; one suture ridged, the other grooved.

This is the plum in which fruit-growers are chiefly interested. The Domestica plums not only are the best known of the cultivated plums, having been cultivated longest and being most widely distributed, but also far surpass all other species, both in the quality of the product and in the characters which make a tree a desirable orchard plant. Although records are vague, it is probable that the Domestica plums came from the region about the Caucasus Mountains and the Caspian Sea. What seems to be the wild form of this species has been found by several botanists in this great region. Here the Huns, Turks, Mongols, and Tartars, flowing back and forth in tides of war-like migration, maintained in times of peace a crude agriculture long before the Greeks and Romans tilled the soil. The plum was one of their fruits and the dried prune a staple product. Here, still, to the east, west, and north toward central Asia, plums are among the common fruits, and prunes are common articles of trade. Even in the fertile oases of the great central Asian desert, plums are cultivated, but whether domesticated here or brought from elsewhere is unknown. At about the time of Christ, or somewhat before, communication had been opened between the Romans and the countries about the Caspian Sea, and a few centuries later hordes of Asiatics came westward and for several centuries continued to pour into eastern Europe. What more probable than that they should have carried dried prunes as an article of food in the invasions, and eventually, as they made settlements here and there, have introduced the trees in Europe? It is certain, at any rate, that several of the groups of cultivated plums trace back to the Balkan countries of Europe and the region eastward.

The Domestica plums are valuable food-producing trees in America, but have not attained the relative importance among fruits that they hold in Europe. From the earliest records of fruit-growing in the New World, the plum has been grown less than the apple, pear, peach, or cherry, while in Europe it is a question if it does not rank first or second among the tree-fruits. The comparatively restricted area which the Domestica plums now occupy in America is due to the fact that they do not possess in so high degree as the fruits named the power of adaptation to the trans-Atlantic environment. Without question, the feature of environment most uncongenial to plums in America is the climate. The plum thrives best in an equable climate like that of eastern and southern Europe and of western America, and cannot endure such extremes of heat and cold, wet and dry, as are found in parts of eastern America and in the Mississippi Valley. This fruit lacks ability to withstand adverse conditions of any kind, whether of climate, culture, insects, or fungi. Thus, in America, this plum suffers severely, not only

from climate but from several parasites, as curculio, black-knot, leaf-blight, plum-pockets and other pests.

In North America, therefore, the Domestica plums are confined to favored localities on the Atlantic seaboard, the Great Lakes regions, and the Pacific coast. In the first-named area they are to be found thriving to a limited degree in Nova Scotia and parts of Quebec, somewhat in central New England, and particularly well in the fruit-growing sections of New York, especially in the parts of this state where the climate is made equable by large bodies of water. South of New York, excepting in a few localities in Pennsylvania, but few plums of this species are grown. The Domestica plums are grown with indifferent success in southern Ontario and in Michigan, and now and then an orchard is found to the south almost to the Gulf. In the great Valley of the Mississippi and in the States of the Plains, this plum is hardly known. Westward in the irrigated valleys of the Rocky Mountains and the Great Basin, the climate is favorable and the European plums are nearly as well-known as in any other portion of the continent excepting the Pacific coast.

It is in the last-named region that the foreign plum reaches its highest development in the New World. The trees in California, Oregon, and Washington are very thrifty, and the plums are of large size, handsome appearance, and high quality. Both tree and fruit in this favored region are free from most of the insect and fungous troubles with which eastern plum-growers must contend. Curculio and black-knot, scourges of eastern orchards, are not troublesome on the western coast. In this region the Domesticas, practically the only plums cultivated, succeed on either irrigated or naturally watered lands.

It is probable that some of these plums were introduced into America by the first colonists, but if so, the early records do not show that the fruit was much grown in this country until toward the end of the eighteenth century. Certainly, during the first two centuries of colonization in the New World there were no such plantations of the plum as there were of the apple, pear, and cherry. Among the first importations of plums were those made by the French in Canada, more particularly in Nova Scotia, Cape Breton, Prince Edward Island, and in favored situations such as the L'Islet County and the Island of Montreal on the St. Lawrence River. In Massachusetts some plums were planted by the Pilgrims, according to Francis Higginson, writing in 1629. The plum was early introduced in several of the southern colonies; so say Beverly, writing in 1722 of Virginia, and Lawson in his history of North Carolina, written in 1714.

Insititia Plums

2. *Prunus insititia*, Linn. Damson Plums. Tree dwarfish; trunk reaching 8 inches in diameter and bearing its head 3-5 feet from the ground; bark gray with a tinge of red, smooth, with transverse cracks. Leaves small, obovate; apex obtuse or abruptly pointed; base cuneate or narrowed and rounded; margins finely and closely, sometimes doubly serrate or crenate, usually glandular; texture thin and firm; upper surface rugose, dark green, slightly hairy; lower surface paler and soft, pubescent; petioles ½ inch long, slender, pubescent, tinged with red; glands few or glandless. Flowers expanding with or after the leaves, 1 inch or less in size; borne in lateral, umbel-like clusters, 1, 2 or rarely 3 from a bud, on slender pedicels, which are pubescent and ½ inch in length; calyx-tube campanulate, glabrous or nearly so, green or tinged with red. Fruit globular or oval, often necked, less than 1 inch in diameter, variously colored but usually bluish-black or amber-yellow, with a heavy bloom; skin thin, tough; stem slender, ½ inch long, more or less pubescent; cavity shallow, narrow; apex roundish or flattened; suture indistinct or a line; flesh firm, yellow, juicy, sweet or acid; stone clinging or free, turgid, ovoid, smooth, ridged on one edge and grooved on the other.

The trees of the Damson plums are readily distinguished from the Domestica sorts in having a dwarfer and more compact habit; much smaller and more ovate leaves, with more closely serrate margins; branches more finely divided, more slender, with shorter joints, and bearing spines or spinescent spurs; having a more abundant and a more clustered inflorescence, with smaller flowers; a glabrous instead of a pubescent pistil and calyx-tube; reflexed calyx-lobes, whereas in Domestica they are often erect; and flowers appearing nearly a week later. The fruit-characters of the Damson plums are even more distinctive. The fruits are smaller, being less than an inch in diameter; more nearly round or oval; more uniform in shape, never strongly compressed as in Domestica; with a less distinct suture; and more often with a pronounced neck. The color is usually the Damson purple or the Mirabelle yellow, with no intermediate colors as in Domestica, and with few or but slight variations as compared with the other species. The plums are sweet or sour, and have a very much smaller range in flavor in the case of the Insititias. The stones are smaller, more oval, and much more swollen.

In variability the Insititia plums are quite the reverse of the Domesticas, almost wholly lacking this quality. These plums have been cultivated over two thousand years, yet there is seemingly little difference between the sorts described by the Greeks and Romans at the beginning of the Christian Era and those we are now growing. So, too, one often finds half-wild chance seedlings with fruit indistinguishable from varieties under the highest cultivation. This pronounced immutability of the species is one of its chief characteristics.

The hardiness, thriftiness, and productiveness of all the varieties of this species commend them to those who cannot give the care required for the less easily grown Domesticas. In America, as in Europe, these plums are to be found in almost every orchard, and in many communities half-wild, thriving with little or no care. The fact that they are easily propagated, growing readily from suckers, and coming true to seed, is an added reason for their general distribution. The Insititia plums do not seem to hybridize freely with other species —at least there are no recorded offspring of such hybrids, though some believe the Reine

Claudes to be a hybrid group between this species and the Domesticas, and there is much evidence in the fruit to show that the French Damson is part Domestica. The tree-characters of the Insititia plums, especially as regards vigor, hardiness, productiveness, and freedom from disease are such as seemingly to make hybrids with them very desirable. That this species can be hybridized with Domestica, at least, is certain from work done at the Geneva, New York, Station, where a number of crosses between them have been made. Four groups of plums, the Damsons, Bullaces, Mirabelles, and St. Juliens, comprising nearly a hundred varieties, may be referred to this species.

The Cherry or Myrobalan Plums

3. *Prunus cerasifera,* Ehrh. Tree 25 feet in height; branches upright, slender, twiggy, unarmed or sometimes thorny; branchlets soon glabrous, becoming yellow or chestnut-brown. Leaves small, short-ovate; apex acute; base cuneate or rounded, thin, membranaceous; texture firm, light green, glabrous on both surfaces at maturity, though hairy along the rib on the lower surface, margins finely and closely serrate; petiole ½ or ¾ inch long, slender, glandless, glabrous. Flowers large, ¾ inch in diameter, expanding with the leaves. Fruit small, ½ inch in diameter, cherry-like, red or yellow; skin thin and tender; flesh soft, juicy, sweet, pleasantly flavored; stone oval, short-pointed at both ends, turgid, ridged on one suture and grooved on the other.

The Cherry plum first came to notice in pomological literature as the Myrobalan plum, a name used as early as the last half of the sixteenth century, but why applied to this plum is not known. Myrobalan had long before been used, and is still used, as the name of several plum-like fruits of the East Indies, not of the genus Prunus, which are used in tanning, dyeing, ink-making, and embalming.

There are few cultivated Cerasiferas, but the species is generally distributed wherever plums are grown, because of the use to which it has been put as stocks for other species. For this purpose it is held in high esteem the world over. It is now used more than any other stock, and may commonly be found fruiting here and there from plants set for or used as stocks. In fact, practically all the cultivated varieties have arisen as survivals of plants meant for stocks. It is almost certain that Cerasifera, or Myrobalan stock, as it is universally known by horticulturists, dwarfs the cion, and that it is not equally well suited to all varieties; but it does not "sprout" as badly as some other stocks, is adapted to many soils, and the young trees grow well and are readily budded, giving at the start a strong and vigorous orchard tree.

Japanese Plums

4. *Prunus salicina,* Lindl. Japanese Plum. Tree 20-30 feet in height; trunk 6-12 inches in diameter, straight; bark thick, rough, numerous corky elevations especially on the branches, reddish or cinnamon-brown, peach-like. Leaves borne abundantly, small or but medium size, oblong-obovate; point acuminate or abrupt, prominent; base rounded, firm, thin; margins finely and closely serrated, sometimes in two series; teeth usually glandular; upper surface bright green, glabrous; lower surface dull, whitish, glabrous or slightly pubescent on the veins; veins pronounced; petioles ½ inch in length, stoutish, tinged with red; glands few or several, usually globose, greenish. Flowers expanding before, with or sometimes after the leaves, first of the plum blossoms to appear, very abundant, ¾ inch in diameter; 3 springing from each flower-bud, often in dense clusters on lateral spurs and lateral buds on one-year-old wood. Fruit varying from very early to late; large, 1-2 inches in diameter, globular, heart-shaped or conical; cavity deep; apex pointed; suture prominent; color bright red or yellow, never blue or purple, lustrous, with little or no bloom; dots small, numerous, conspicuous; skin thin, tough, astringent; stem ½ inch in length; flesh red or yellow, firm, fibrous, juicy; stone clinging tenaciously or free, small, rough or lightly pitted, oval to ovate, one edge grooved, the other ridged.

The Japanese plums are now cultivated in all parts of the world where plums are grown; yet, outside of Japan and China, they have been grown for their fruit less than half a century. Despite the fact that these plums have been grown in Asia for several centuries, the wild form is not known. It is, however, almost certainly a native of China, though it is likely that the habitat of the species cannot be accurately determined until western and southwestern China have been explored by botanists, these regions as yet being almost unknown to foreign scientists.

This fruit is a most valuable addition to pomology, no less than ninety-two varieties now being under cultivation in America. At first it was thought desirable only for the southern states, but it proves to be nearly as hardy as the Domestica plums in the northern states, and is now widely distributed north and south. The plums of this species possess several striking features that commend them to fruit-growers. Undoubtedly the most valuable attribute of the Japanese plums is their wide range of adaptability, adapted as they are to a much wider range of country and of conditions than the Domesticas. But even where both types of plums succeed, the newer plum introduces several very desirable features, quite aside from additional variety which the many distinct sorts furnish. Thus, as a species, the Japanese are more vigorous and productive than the Domestica plums, earlier in coming in bearing, and freer from diseases, especially black-knot and leaf-blight. They are also less subject to curculio than most of the native and European species; the fruits keep longer than those of the better-known Europeans, and ship as well. As compared with native varieties, the plums from Japan are larger, handsomer, and better flavored, and keep and ship better. Some disadvantages are that they blossom so early as to be often caught by spring frosts; they are rather subject to brown-rot; for most part they are tenacious cling-stones; the species, all in all, is less hardy to cold than the Domestica plums; lastly, they are inferior in quality to the varieties from Europe. The last fault is so serious that, though the average for the Japanese plums is high, making them unquestionably more desirable inhabitants of the orchard than any of the native species, they cannot compete with the Domesticas where the two types can be equally well grown.

The botanical differences between these Asiatic plums and those from Europe and America are most interesting. In general as-

pect, the trees of the Japanese plums in summer or winter are much more like those of the American species than those from Europe or West Asia; so, too, the fruits are more alike in appearance and in quality, and the peach-like foliage of the Japanese might easily be mistaken for that of our native varieties of Hortulana or Munsoniana. In the manner in which the buds are borne and in vernation, the resemblance of the oriental species to the Americanas, Hortulanas, and Munsonianas is again most striking. In Asiatic and American species the buds are borne in twos and threes, while in the European species they are more often single or double. As might be expected from their nearness of kin, the Japanese plums hybridize readily with the American species and especially with the Hortulanas and Munsonianas, species which they most resemble.

Simon's Plum

5. *Prunus Simonii,* Carrière. Tree small upright, dense, hardy, unproductive. Leaves folded upward, oblong-lanceolate to obovate, peach-like, narrow, long, of medium thickness; upper surface dark green, smooth, shining; lower surface pale green, not pubescent, with prominent midrib; margin slightly crenate; petiole short, thick, faintly tinged red, with 4 large globose glands on the stalk. Flowers numerous on one-year wood although found on spurs on the older wood; appearing very early, small, pinkish-white; borne singly or in pairs, often defective in pollen. Fruit early; 1¾ by 2 inches in size, oblate, compressed; cavity deep, wide, flaring, regular, russeted; suture swollen near the apex which is flattened or strongly depressed; dark red or purplish-red, overspread with waxy bloom; dots numerous, dark colored, with russet center, inconspicuous; stem thick, characteristically short; skin tough, bitter, adhering to the pulp; flesh rich yellow, juicy, tough, firm, very mild subacid with a peculiar aromatic flavor; of fair quality; stone clinging, about ⅞ inch in diameter, round, turgid, truncate at the base, tapering abruptly to a short point at the apex, with characteristic rough surfaces; ventral suture narrow, acute or with distinct wing; dorsal suture very blunt or acute, not grooved.

All that is known of the history and habitat of this species is that it came from China in 1867, having been sent to the Paris Museum of Natural History by Eugene Simon, a French consul in China. The spontaneous form has not been found. The general aspect of the tree is more that of the peach than of the plum, and the drupes are as much like apricots or nectarines as plums; but, when all characters are considered, the fruit can better be classed with the plums than with any of the other stone-fruits named. Simonii is widely grown in America for its fruits, but it cannot be said that it has become popular, only one variety of the species being now under cultivation. The plums lack palatability, and the trees are subject to too many pests. *Prunus Simonii* has been successfully hybridized with *P. salicina,* and, as secondary crosses, its blood has been mingled with that of some of the native species as well. Most of its hybrid offspring have more value than the parent, for nearly all of them are free from its disagreeable taste.

The Americana Plums

6. *Prunus americana,* Marsh. Red Plum, Yellow Plum, Horse Plum, Hog Plum, Sloe. Tree attaining a height of 30 feet; trunk short; bark ½ inch thick, dark grayish-brown, outer surface rough, shaggy with large scales giving a characteristic aspect; branches spreading, crooked, long, rigid, but often pendulous at the extremities, more or less thorny, with lateral, spinescent branchlets; branchlets light green, usually glabrous, sometimes much or little tomentose, at first brownish, later tinged with red; lenticels numerous, large and distinct. Leaves oblong-obovate, acuminate at the apex and rounded at the base, firm in texture, becoming coriaceous; margins sharply serrate, often doubly serrate, the coarse and double serrations characteristic; glabrous or slightly pubescent, coarsely veined; midrib grooved on the upper side; petioles slender, ⅔ inch in length, usually glandless. Flowers expanding after the leaves, large, 1 inch in diameter, borne in lateral umbels, two- to five-flowered, mostly on one-year-old wood; pedicels ½ inch long, slender, glabrous. Fruit variable in ripening period; globose, conical, oval, or oblique-truncate, 1 inch in diameter, red or yellowish, dull, with or without bloom; dots pale, numerous, conspicuous; cavity shallow or lacking; suture a line; skin thick, tough, astringent; flesh golden-yellow, juicy, fibrous, sweet, acid; stone clinging or free, turgid or flattened, the apex pointed, ridged on the ventral and grooved on the dorsal suture; surfaces smooth.

This is the predominating native plum. It is the most widely distributed of all the native species, is most abundant in individual specimens, and has yielded the largest number of horticultural varieties. Because of its prominence and comparatively high degree of permanency of characters, it may well be considered the type from which has sprung not only its botanical varieties but several others of the American species. Its variability, also, is shown in its many diverse horticultural varieties; and of its adaptability, it may be said that it flourishes in nearly all soils and exposures, and is found wild or cultivated from Maine to Florida, and northward from Mexico along the eastern slope of the Rocky Mountains, well into Canada.

The plums of this species in the Mississippi Valley are distinguished from the eastern and typical form by fruits having a length greater than the diameter, by different aspect of tree, and by flatter seeds, which are usually conspicuously longer than they are broad. All the cultivated varieties come from the western form. The plant of *P. americana* in the dry plain regions of Kansas and Nebraska becomes shrubby in character, while on the alluvial bottom lands along the streams in this region it retains the character of a tree. In the southern limit of its range, the leaves are more or less pubescent on the lower surface. As the species occurs throughout western New Mexico, Colorado, Utah, Wyoming, Montana, and Manitoba, it differs enough from the eastern types to be considered a sub-species, having a wholly different aspect of tree, silvery and somewhat scurfy twigs, smaller, thinner, and lighter-colored leaves, and smaller fruits with more roundish stones.

The domestication of Americana plums is due to the fact that the plums of Europe will not thrive in the Mississippi Valley, the prairie states, nor, for the most part, in the South. The European species are tender both to cold and heat in these regions, and they are attacked by those scourges of plum-culture, black-knot, leaf-blight, and curculio. If, then, the people in the West and South were to

have plums at hand when wanted, the wild species had to be brought under cultivation. Where the two will grow side by side, it is doubtful whether any one would choose to grow the Americanas in preference to the Europeans even for the sake of variety.

The fruit is reddish or yellowish, or a blending of the two, with the red varieties predominating. Often the color is more nearly orange than red or yellow—in fact, pure yellow fruits cannot be found. Wild or cultivated, the fruits of the Americana plums vary greatly in season, size, shape, and flavor. In the orchard, the period of maturity covers a range of several weeks, beginning in August and ending in October; in the wild, trees in the same thicket may vary as much as three weeks in ripening their fruit. The size of the cultivated sorts ranges from that of a Damson to that of some of the Gages; the shape is round-oval, or quite oval, sometimes oblique and sometimes truncate at one or both ends, and often more or less compressed. The wild fruits have a pleasant flavor, and this is much improved under cultivation, so that when fully ripe the flesh of some sorts is sweet and luscious, hardly surpassed, if the skin be rejected, by the best Domesticas. The skin is usually thick, coriaceous, acerb or astringent; this with the tenaciously clinging stones, is the chief defect of these fruits. In some varieties skin and stones are far less objectionable than in others.

The trees are not very manageable in the orchard. They make a very slow growth and are hard to control, producing at maturity many leaning trunks that are often crooked, as are also the branches, which, with the unkempt heads, give an impression of waywardness and wildness. Nearly all of the varieties over-bear, and, unless thinned, the fruits are so small as to be hardly worth harvesting; not infrequently trees die from over-bearing. A few varieties are unfruitful, but usually because of defective pollination. Nearly all sucker badly on their own roots, and, except in cold regions, should be grown on other stocks. In general, there are fewer pests to combat with these than with the European plums, yet they are far from being exempt and require quite as much spraying as do other plums.

The Americana plums are all hardy, and some of the varieties can be grown as far north as general agriculture is practiced. This, with the Nigras, will probably always be the chief group for dry, cold regions between the great Lakes and the Rocky Mountains. It may also be relied upon in the colder parts of New York and New England. The flower-buds as well as the trees are hardy, having been known to withstand a temperature of forty degrees below zero. Since the blossoms open comparatively late, there is less damage from spring frosts in this than in most other species, even of the natives.

Prunus americana mollis, Torrey and Gray. Woolly-leaved Plum. This is a western and southwestern form of *P. americana,* the sub-species being distinguished from the species by the amount and character of the pubescence on the leaves and shoots. The leaves, petioles and shoots of this plum are soft-pubescent, almost tomentose, the tomentum being pale in color and usually very dense; the calyx-lobes are pubescent on both sides and the pedicels are appressed and densely pubescent.

It is impossible to give the range of the group, as the woolly-leaved plum of the West gradually passes into the smooth-leaved species of the East, and the two forms are not infrequently mixed in the South and Southwest. It can only be said that the sub-species is to be found in the greatest abundance in the region extending from southern Iowa through Missouri. Only two varieties of this plum, Wolf and Van Buren, are in general cultivation. In neither fruit- nor tree-characters do these differ greatly from the Americana plums.

The Hortulana Plums

7. *Prunus hortulana,* Bailey. Tree 30 feet or more in height; trunk and branches rough and shaggy; bark gray-brown, thick and containing deposits of red cells when the bark is sectioned; branches very spreading and open, twiggy, slender, thorny; branchlets light green at first, becoming reddish-brown, glabrous and glossy; lenticels few, large, very coarse, raised. Leaves 1¾ inches wide, 3 to 5 inches long, long-oval with a tapering, pointed, acuminate apex, peach-like, thin, becoming leathery; margins serrate, sometimes in a double series, glandular; upper surface smooth, glossy, glabrous; lower surface light green, glabrous except on ribs and veins which are very pubescent, with characteristic orange color; midrib grooved above, rounded below, very prominent; petioles slender, 1 inch in length, tinged with red; glands 2-8, small, globose. Flowers expanding after the leaves, blooming later than any other cultivated plum, ¾ inch across; odor disagreeable; clusters borne from lateral buds on one-year-old wood only, characterizing the species, the fruit-spurs making a very long growth; 2-6 flowers from a bud; pedicels ¾ inch long, very slender, glabrous. Fruit very late, globose, oval, 1 inch in diameter; color red or yellow; dots numerous, small, conspicuous; suture very shallow or only a line; skin thick, tough, astringent; flesh golden-yellow, juicy, coarse, fibrous, firm, mildly sweet, astringent at the pit, aromatic; stone clinging to the flesh, turgid, long-oval, small, prolonged at the ends, the surfaces rough and reticulated.

This species gives to American pomology a very distinct and valuable group of plums which are adapted to a wide range of conditions, especially of climate. The Hortulanas are particularly well-suited to the Mississippi Valley and southern states, and fruit well as far north and east as New York. The product of Wayland, Kanawha, and Golden Beauty, best known of the score of plums belonging to this species, is especially suitable for preserves, spicing, and jelly, being unsurpassed for these purposes by any other plums excepting Damsons. They are quite too acid, and the flesh clings too tenaciously to the stone for dessert plums or even for ordinary culinary purposes. These plums, having firm flesh and tough skins, ship and keep well, and, since they are the latest of the native plums in ripening, extend the season for this fruit very materially. The Hortulana plums hybridize freely with other native species, and their hybrids are such as to commend this species very highly to plum-breeders for hybridization.

Prunus hortulana Mineri, Bailey. The sub-species differs from the species in having shorter, stiffer, less graceful branches; leaves smaller, thicker, rougher and of a bluish-green cast; the blossoms of the two are much the same, but those of the sub-species open a few

days earlier; the fruits of the sub-species are larger than those of the species, lighter red, have more bloom, are less firm in texture, ripen earlier, yet later than those of any other species, and are quite different in flavor, having more nearly the taste of the fruit of *P. americana;* the stones, as well as the fruits, are very different, being in the sub-species larger, broader, flatter, smoother and less pointed. The chief representatives of the Miner-like plums under cultivation are Miner, Forest Rose, Prairie Flower and Clinton.

In the orchard, the Miner-like plums behave much like the Americana plums. In some respects the fruits are an improvement upon those of the Americana varieties. Thus, the skin is usually less tough and brighter in color; and the flavor is a little better. These plums seem to be nearly or quite as hardy as the Americanas, and are adapted to quite as wide a range of soils. The trees of the Miner-like plums are more amenable to domestication than those of *P. americana,* having as orchard plants straighter trunks, more symmetrical and less unkempt tops, and making larger trees. The fruits ripen so late as to make the varieties of this group especially valuable in prolonging the season for plums in regions where native varieties are grown exclusively.

The Nigra Plums

8. *Prunus nigra,* Ait. Canada Plum. Tree small, seldom exceeding 20 feet in height; bark thin, ¼ inch thick, dark red or light gray-brown, rough, but not shaggy, with thick scales; branches upright, stout, rigid, armed with stout, spiny spurs; branchlets more or less zigzag, glabrous or tomentose, green, later becoming reddish-brown. Leaves large, broad-oval, obovate, with a long-acuminate apex and cuneate or subcordate base; margins doubly crenate-serrate, with teeth tipped with glands which disappear as the leaves mature; thin and firm in texture; upper surface light green, glabrous, the under surface pale, pubescent when young; petioles ⅔ inch long, stout, with two large, dark red glands near the blade. Flowers expanding before or with the leaves, large, sometimes 1½ inches across; borne in three- or four-flowered lateral umbels on slender, glabrous, red pedicels ½ inch or more in length. Fruit early; round-oblong, 1 inch in diameter, red, orange or yellowish in color, with little or no bloom; skin thick, tough and astringent; flesh yellow, firm, often acid or astringent; stone clinging, large, oval, compressed, thick-walled, with a sharp ridge on the ventral and a slight groove on the dorsal suture.

The Nigra is the most northern of the American plums, being an inhabitant of a region bounded on the north by a line passing from southern Newfoundland westward to the Strait of Mackinac, thence southward to Lansing, Michigan. The species is common in New England, northern New York, where it is sometimes cultivated about houses, and westward at least as far as the eastern shore of Lake Michigan. In the great region outlined above, it is distributed in more or less scattered localities, being found usually in the valleys of rivers and streams, though often on high lands and in open woods.

The Nigra plums are important horticulturally because they can be grown in colder regions than the Americanas. They not only endure more cold than the last-named group, but their tough wood enables them to stand better the weight of snows and the stress of winds. Earliness in ripening, also, prolongs the season for this type of fruit; and, in regions where the season is short, the Nigras may be grown with more certainty than other groups. About forty varieties of this species are under cultivation.

The Subcordata Plums

9. *Prunus subcordata,* Benth. Western Plum. Tree small, rarely attaining a height of 25 feet, sometimes a shrub 10 or 12 feet high, often a bush but 3 or 4 feet in height; bark gray-brown and deeply fissured; branches stout and spreading; branchlets glabrous or pubescent, bright red becoming darker red and finally a dark brown or gray; lenticels minute, white. Leaves round-ovate, sub-cordate, truncate, or cuneate at the base; margins sharply or obtusely serrate, sometimes doubly serrate; young leaves pubescent, at maturity nearly glabrous, coriaceous, with very conspicuous midribs and veins. Flowers white, fading to rose, 1 inch across; appearing before the leaves; usually borne in threes on short, pubescent pedicels. Fruit ripens in late summer or early autumn; round-oblong, 1 inch in length, borne on a short, stout stem; flesh subacid, clinging to the flat or turgid stone which varies greatly in size, pointed at both ends, crested on the ventral edge and grooved on the other.

The Subcordata plums are inhabitants of the region east of the Coast Range from southern Oregon to central California. The species is so rarely found on the seacoast as to have escaped the attention of the early botanists and remained unknown until the middle of the nineteenth century. This plum is one of the standard food products of the aborigines in the region in which it grows; and is sometimes dried at the harvesting places and carried considerable distances to the Indian villages. The trappers, the first men to enter the habitat of this plum, followed by the gold-seekers and ranchers, all knew and esteemed the fruit. The early settlers regarded it as the most useful of all the wild fruits of the Coast, and attempts were made at an early date to domesticate it.

In its typical form, *P. subcordata* is a shrub, but under favorable conditions attains the dimension and shape of a small tree. In its roundish, roughish leaves it so closely resembles the Old World type of plums that it becomes the nearest approach to them to be found among American species. But in the globular, red or purple sub-acid fruit, it betrays its affinity to the American plums, as it does also in the flat, turgid, smooth stones to which the flesh tenaciously clings. The fruit is sometimes so poor in quality as to be inedible; but, on the other hand, is sometimes quite equal to some of the cultivated plums, especially in its botanical variety, Kellogii.

Prunus subcordata Kellogii, Lem. Sisson Plum, Gray-branch Plum. *Prunus subcordata Kellogii* is distinguished from the species in being a somewhat taller and more slender plant. The branches and bark are of a characteristic ash-gray, so distinct in color from *P. subcordata* that this is often called the "Gray-branch" plum. The leaves are orbicular or elliptical, not cordate, cuneate at the base and nearly glabrous. The fruit is bright yellow instead of red, and is larger than that of the species, being an inch or more in diameter with a more nearly free stone. This plum inhabits the region of Mount Shasta, where it has been known since the time of the early gold diggers; it attracts more attention as a food, and promises more for the cultivator than the species. Locally, it is known as the Sisson plum, after a Mr. Sisson living near Mount Shasta who brought it to notice. At present, this plum seems to be the branch of promise for the improvement of the wild plums of the western coast.

The Angustifolia Plums

10. *Prunus angustifolia,* Marsh. Mountain Cherry. Plant seldom a true tree, usually, however, forming a distinct trunk with a twiggy, bushy top; bark thin, dark reddish-brown, slightly furrowed or roughened, scaly; branches slender, zigzag with long, thin thorns or spine-like branchlets; branchlets slender, zigzag, glabrous, glossy, bright red. Leaves folded upward, oblong-lanceolate, pointed at both ends, thin, membranaceous; margins closely and finely serrate; teeth tipped with glands; upper surface glabrous, lustrous, bright green; lower surface glabrous or pubescent in the axils of the veins, dull, ⅔ inch wide and 1-2 inches long; petioles ½ inch long, slender, glabrous or tomentose, bright red with two red glands near or on the base of the leaf. Flowers appearing with or before the leaves, small, less than ½ inch across, very numerous; umbels sub-sessile, 2- to 4-flowered, from lateral spurs or buds; pedicels glabrous, slender, ½ inch in length. Fruit ripening early; ovoid, ¾ inch in diameter, bright red, sometimes yellow, glossy, with little or no bloom; dots numerous, very conspicuous; skin thin; flesh tender, juicy, yellow, subacid; stone small, clinging, ovoid, turgid, roughened, cherry-like, edges rounded, the dorsal one grooved.

This plum is found in the wild state from southern Delaware to Florida and westward to the Panhandle of Texas and southern Oklahoma. It usually grows in rich soils, but is found as well in worn-out fields and pastures, most often in thickets of small trees or thorny shrubs or scraggly bushes, producing under the latter conditions small fruits so like cherries as to give it the name in some localities of "Mountain Cherry" (Maryland), and in others of "Wild Cherry" (Louisiana).

Since the species has been long known, and is so near at hand to fruit-growers, without more of its offspring coming under cultivation, it is not likely that it may be counted upon to furnish much for the orchard. Neither trees nor fruits are promising for the cultivator.

Prunus angustifolia Watsoni, Waugh. Sand Plum. Shrub 4-10 feet high; branches slender, short-jointed, zigzag, reddish-brown; branchlets at first bright red and lustrous, later becoming brownish-red or sometimes ashy-gray. Leaves small, ovate; apex acute; base rounded or cuneate; margins finely crenulate; upper surface glabrous, shining; lower surface paler, glabrous; petioles reddish, ½ inch in length, bi-glandular at the apex. Flowers in fascicles of 2-4, borne with or before the leaves and in great abundance. Fruit ⅔ inch in diameter, globose, sometimes oblong, orange-red, bloomless; skin thin, tender; flesh yellow, juicy, tender, pleasant flavor; stone turgid, compressed at the apex, thick-walled, round on the ventral and sometimes on the dorsal suture.

This is the sand plum of the plains, an inhabitant of southern and southeastern Nebraska, central and western Kansas, and possibly passing into western Oklahoma. It is usually found along the banks of streams and rivers, where it often forms shrubby thickets. The wild plums are held in high esteem for dessert and culinary purposes, and are occasionally transplanted to the garden or orchard. From such transplantings a half dozen varieties have arisen. The productiveness, hardiness to heat and cold, and the size and quality of the fruits should attract plum-growers in the region of its habitat and experimenters elsewhere as well. The Sand plum differs from Angustifolia in its dwarfer habit; shorter-jointed, zigzag, ashy-gray branches; smaller but thicker leaves; large, thicker-skinned, and better-flavored fruit, which ripens later; and in a smaller and somewhat differently marked stone.

Prunus angustifolia varians, Wight and Hedrick. Plant a small tree, attaining a height of 25 feet; trunk small but well-defined; branches spreading, bushy, armed with spinescent branchlets; young wood slender, zigzag, glabrous, glossy, reddish but approaching a chestnut-brown. Leaves oval-lanceolate, 1-2 inches long, 1 inch wide, narrowed at the base, acute at the apex; margins very minutely glandular-serrate; upper surface glabrous and lustrous; lower surface paler, glabrous; petioles slender, reddish, about ½ inch long, pubescent along the upper side, eglandular or with 1 or 2 glands at the apex. Flowers appearing before the leaves in the South and with the leaves in the North; ½ inch broad; pedicels ½ inch long, glabrous. Fruit globose, red or yellow, with light bloom; stone about ½ inch long, ¾ inch broad, turgid, ovoid to elliptic-oblong, obscurely pointed at the apex or sometimes slightly obtuse, truncate or obliquely truncate at the base, grooved on the dorsal edge; ventral edge with a narrow, thickened and slightly grooved wing, the surfaces irregularly roughened.

In the wild, *P. angustifolia varians* forms dense thickets, the larger specimens attaining a height of ten or twelve feet. When budded and grown in the orchard, the plant is a small tree with well defined trunk and spreading branches, sometimes armed with slender spinescent branchlets. The sub-species is distinguished from the species by more robust habit; the young twigs less reddish; by pediceled flowers; and by the stone in most cases being more pointed at the apex. It occurs locally from southern Oklahoma through eastern Texas southward possibly to the Colorado River, and probably westward to the Panhandle region. The fruit of the sub-species appears to be superior to that of the species. Hybrids between this form and *P. Munsoniana* occur freely both in the wild state and under cultivation. The varieties Eagle and El Paso have probably originated in this way. Nearly all of the plums belonging to this species, some twenty in all, are tender to cold, and none succeeds in the North. African, Cluck, Jennie Lucas, and Yellow Transparent may be named as representative varieties.

Munsoniana Plums

11. *Prunus Munsoniana,* Wight and Hedrick. Tree medium to large, from 20-30 feet in height; bark grayish-brown, shaggy, furrowed; branches spreading, slender, zigzag, little or not at all thorny; branchlets slender, zigzag, reddish, lustrous, glabrous. Leaves 1¼ inch wide, 4 inches long, oblong-lanceolate; apex acute or tapering, rounded at the base, texture thin; margins closely and finely serrate; teeth with small, dark red glands; upper surface bright green, glabrous, lustrous; lower surface dull green, pubescence sparse along the midrib and veins or sometimes tufted in the axils; petioles slender, about ¾ inch long, reddish, usually with two glands at the base of the leaf-blade. Flowers appearing before or with the leaves; season of blooming late; about ¾ inch across; odor disagreeable; 2 or 4 flowers in a cluster; pedicels ½ inch long, slender, glabrous. Fruit early; globose, 1 inch in diameter, bright currant-red, rarely yellow; bloom thin; dots conspicuous; cavity shallow, narrow; suture a line; apex rounded; flesh light yellow, juicy, soft, fibrous, sweet; aromatic; stone clinging, prolonged at the apex, obliquely truncate at the base, roughened, grooved on the dorsal edge, thick-margined and grooved on the ventral one.

Horticulturally, this is the most important group of native plums for the South; it con-

tains a greater number of cultivated varieties than any other native species excepting *P. americana,* no less than sixty sorts, some of which are deservedly the best known of the native plums for either home or market use. For dessert or the kitchen the fruits are particularly valuable, having a sprightly vinous flavor which makes them pleasant to eat out of hand or when cooked. Their bright colors, semi-transparent skins, and well-turned forms make them very attractive in appearance. Unfortunately, nearly all of the varieties of this species are clingstones. This group hybridizes more freely than any other of the plums, and there are a great number of promising hybrids. Of all plums, these are most in need of cross-pollination, some of the varieties being nearly, or, as in the case of Wild Goose, wholly self-sterile. While these plums are especially valuable in the southern states, some of them are desirable in the North as well, where all will grow at least as far north as central New York. The leading varieties under cultivation are Arkansas, Pottawattamie, Robinson, Newman, Wild Goose, and Downing.

Maritima Plums

12. *Prunus maritima,* Marsh. Beach Plum. Shrub 4-10 feet high; main branches decumbent and straggling or upright and stout; bark dark brown or reddish, more or less spiny, often warty; branchlets pubescent at first, dark reddish-brown, slender; lenticels few, small, dark. Leaves obovate, short-acute, rounded at the base; margins closely and evenly serrate, thin and somewhat leathery; petioles less than ½ inch long, stout, tomentose or glabrous; glands two, sometimes more, at the base of the leaves. Flowers small, appearing before the leaves; borne in 3-flowered umbels closely set along the rigid branches. Fruit maturing in late summer; ½ inch in diameter, globose, flattened at the ends; cavity shallow, borne on a slender pedicel ½ inch in length, dark purple with a heavy bloom, sometimes red, less frequently yellow; skin thick, tough and acrid; flesh crisp, juicy, sweet; stone free from the flesh, small, turgid, pointed at both ends, cherry-like, acutely ridged on one and grooved on the other edge.

This species, in its typical form, is an inhabitant of the sea beaches and sand dunes from New Brunswick to the Carolinas, or possibly farther south, growing inland usually as far as ocean soil formations extend. As it leaves the seaboard, marked variations make their appearance, chief of which are smaller, more oval, smoother, and thinner leaves and smaller fruit. In the region where it is found wild, the Maritima plum is a rather common article of trade. The fruit is used for both dessert and culinary purposes, chiefly for the latter.

This plum has a number of qualities that commend it to the fruit-grower. Since in the wild it grows on sandy soils, it is not likely under cultivation to make great demands on either the moisture or the fertility of soils. The plant is very hardy, very productive, seldom fails to bear, and seems to be free or nearly so from some of the pests of cultivated varieties. Two objections to the wild fruits are that when the fruit is harvested the juice often exudes from the wound made by the parting from the stem; and the secretions of some dark-colored substance form a hard core in the pulp, which gives a bitter taste to the fruit. The last defect is common in the wild plums, and is probably due to the sting of an insect.

Orthosepala Plums

13. *Prunus orthosepala,* Koehne. Shrub 4 or 5 feet high; branches dense and twiggy; stems armed with slender spines; bark separating in large loose scales; branchlets stout, reddish-brown. Leaves oblong-ovate, thin, acuminate, long-pointed, 2½-3 inches long, ⅔ inch wide, unequally rounded at the base; margins closely serrate with incurved, calloused teeth; upper surface glabrous, light green; lower surface paler and pilose; petioles slender, grooved, puberulous, ½ inch long; glands 2, large, at the apex of the petiole. Flowers appearing after the leaves; borne in 3- or 4-flowered fascicles on stout pedicels ½ inch long. Fruit globose, 1 inch in diameter, deep red with a heavy bloom; skin thick; flesh yellow, juicy; stone flattened, oval, slightly rugose, deeply grooved on the dorsal and ridged on the ventral edge.

Prunus orthosepala is a true plum, closely related to *P. hortulana,* from which it can be distinguished by the smaller number of glands of the petioles, by the eglandular calyx-lobes, the dark colored fruit and smoother stone. A cultivated plum, taken from the wild, locally known as the Laire, in Rooks and neighoring counties in Kansas, is the only variety of *P. orthosepala.*

CHERRIES

Botanists enumerate about 120 wild cherries, of which but five are cultivated for their fruits, and but two have given pomological varieties of value in the fruit industry of the world. The sour cherry, *P. Cerasus,* is the most important species in America.

The Sour Cherry

1. *Prunus Cerasus,* Linn. Tree reaching a height of 20 to 30 feet, diffuse, open-headed, round-topped; bark reddish-brown overlaid with ashy-gray, smooth; branches spreading, slender; branchlets willowy, glabrous, reddish-brown overspread with ashy-gray. Leaves resinous at opening, very numerous, 3-4 inches long and ½-2 inches wide, obovate, thick and firm in texture; upper surface dark green, smooth; lower surface paler, pubescent; apex acute; base abrupt; margins finely serrate, often doubly so; teeth tipped with small, dark glands; petioles from ½-2 inches long, slender, grooved; glands 1-4. Flowers appearing with or after the leaves, showy, 1 inch across, white; borne in scaly clusters on one-year-old wood; pedicels ½-1½ inches in length, slender. Fruit round-oblate or cordate, sides compressed; suture indistinct; cavity well marked; apex depressed; color light to dark red; dots numerous, small, russet; stem slender, ½-2 inches in length; flesh dark red, with dark colored juice or pale yellow with colorless juice, tender, melting, sprightly, acidulous, sometimes astringent; stone free or clinging, round, smooth, less than ½ inch in diameter; ventral suture usually ridged.

The sour cherry is grown and esteemed in temperate climates the world over. The species is found truly wild in southwestern Asia and southeastern Europe. It is a frequent escape from cultivation, multiplying from seed distributed by birds or human agencies, or growing from suckers which spring so freely from the roots as to make the species unfit for a stock in orchard work. The number of cultivated varieties of *P. Cerasus* is about 300. Sour cherries cultivated for their fruits constitute two distinct groups, each of which

is again divided into many varieties, while a third group is grown for the manufacture of a liqueur. The two groups vary more or less in both tree and fruit, but have a constant difference only in a single, very easily distinguished character—the juice in the fruits of one is red, in the other it is colorless.

Cherries with colorless juice are the Amarelles, from the Latin *amarus, bitter,* a name probably first used by the Germans but now in general use wherever cherries are grown. These Amarelles are pale red fruits, more or less flattened at the ends. Despite the derivation of the name Amarelle, they have less bitterness than the other group of varieties of the sour cherry. They are also less acid than the darker colored cherries, and are therefore more suitable for eating out of hand, the dark-colored cherries being almost exclusively culinary fruits. The common representatives of this group are Early Richmond, Montmorency, and the various cherries to which the word Amarelle is affixed, as the King Amarelle and the Späte Amarelle.

The second group, varieties with reddish juice and usually with very dark fruits, which are more spherical or cordate in shape than the Amarelles, comprises the Morellos of several languages or the Griottes of the French. The first of these terms has reference to the color, the word Morello coming from the Italian, meaning *blackish;* while Griotte, from the French, probably is derived through *agriotte* from *aigre,* meaning *sharp,* in reference to the acidity of the fruits. Weichsel is the German group name for these cherries, rather less commonly used than the other two terms. The trees of the Morello-like varieties are usually smaller, bushier, and more compact than those of the Amarelles. The branches, as a rule, are more horizontal, often drooping, are less regularly arranged and more slender. The leaves, in typical varieties, are of a darker green, smaller, thinner, and pendent; while those of the Amarelles are either horizontal or inclined to be upright; the leaves are also toothed less deeply and more regularly. The typical varieties of this group are English Morello, Ostheim, Olivet, Brusseler Braune, Vladimir, and Riga.

A third division of the species is the Marasca cherry from which is made maraschino, a distilled liqueur much used in Europe as a drink, and in Europe and America in the manufacture of maraschino cherries. The Marasca cherry is a native of the province of Dalmatia, Austria, where the trees grow wild, and are now sparingly cultivated. Botanists include this cherry in the species under discussion, *P. Cerasus marasca.* Marasca cherries differ from the other cultivated forms chiefly in the greater vigor of the trees, relatively finer serrations of the leaves, longer stipules, and a more compact inflorescence. The fruits are much smaller than in the common sour cherries, are deep red or almost black in color, and have intensely red flesh and juice. The cherries are very acid, with a bitter taste that gives flavor to the maraschino made from them.

The Sweet Cherry

2. *Prunus avium,* Linn. Tree reaching a height of 30-40 feet, upright-spreading, open-topped, usually with a central leader; branches stocky, smooth, dull ash-gray; branchlets thick, long, grayish-brown, smooth, with small lenticels. Leaves resinous at opening, more or less drooping, 4-6 inches long, 2-3 inches wide, oblong-ovate, thin; upper surface dark green, rugose; lower surface dull green, pubescent; apex acute; base abrupt; margin coarsely and doubly serrate, glandular; petiole 1¾ inches long, slender, dull red, with 1-3 small, globose, reddish glands on the stalk. Flowers with or after the leaves; white, 1¼ inches across; in clusters of 2 or 3; pedicels 1 inch long, slender, glabrous. Fruit early; 1 inch in diameter, cordate; cavity deep, wide, abrupt; suture a line; apex round or pointed; yellow, red or purplish-black; dots numerous, small, russet; stem 1½ inches long, adherent to the fruit; skin tough, adherent to the pulp; flesh yellow, red, or dark purple with colorless or colored juice, sweet; stone semi-clinging, ⅜ inch long, elliptical, flattened, blunt, with smooth surfaces.

Through its cultivated varieties, *P. avium* is everywhere known in temperate climates as the sweet cherry. Wild forms are variously called Mazzard, Bird, Wild, Crab, and Gean cherries. It is not so hardy a species as *P. Cerasus* and is, therefore, less generally grown, but still is a favorite orchard, dooryard, and roadside plant in all mid-temperate regions. It refuses to grow, however, in the warmest and coldest parts of the temperate zones. Wherever the species thrives as an orchard plant, it is to be found growing spontaneously along fences and roadsides and in open woods, from seeds distributed by birds. The fruits of these wild sweet cherries are usually small, and the flesh is thin and dry, often unpalatable; but, on the other hand, trees are sometimes found as escapes from cultivation which rival in their products the orchard-grown cherries. The number of cultivated varieties of *P. avium* is about 600.

The habitat of the species is in southern and central Europe and Asia Minor, where it is to be found in moderately dry soils and seldom in the shade, preferring always warm, sunny sites, such as gravelly or stony hillsides; these predilections cling to the species in its cultivated varieties. *P. avium* differs from *P. Cerasus* in an important horticultural character as the two species grow spontaneously; the former suckers from the root little or not at all, and hence is a suitable plant for a stock in orchard work; while the latter suckers so much as to make it unfit for use as a stock.

The sweet cherry is variously divided by botanists and pomologists; but whatever distinct forms of the species may exist in the wild state, they are now interminably confused by hybridization under cultivation. It is impossible to group pomological varieties into botanical varieties, as many botanists have attempted to do. The species can be roughly divided into two pomological groups, the distinguishing character being the texture of the flesh.

Sweet cherries with soft tender flesh form one group, known by pomologists under the French group-name Guigne or the English Gean. These are also the Heart cherries of common parlance. These soft-fruited cherries may again be divided into dark-colored varie-

ties with reddish juice and light-colored sorts with colorless juice. Typical light-colored Geans are Coe, Ida, Elton, and Waterloo; dark-colored ones are Black Tartarian, Early Purple, and Eagle. The second group is distinguished by the firm, breaking flesh of the fruits, the Bigarreaus of several languages, the name originally having reference to the diverse colors of the fruits. (French *bigarrer* means *to streak.*) This group is further divisible in accordance with color of fruit and juice into black Bigarreaus and light Bigarreaus. Chief of the black cherries falling into this division are Windsor, Schmidt, and Mezel; of the light ones, which are much more numerous, Yellow Spanish and Napoleon are representative sorts.

The Duke Cherries

The Duke cherries, long placed by most pomologists and botanists in a botanical variety of *P. avium,* are unquestionably hybrids between the sweet cherry and the sour cherry. A study of the characters of the varieties of Duke cherries shows all gradations between *P. Cerasus* and *P. avium,* though, in the main, they resemble the latter more than the former, differing from the sweet cherries most noticeably in having acid flesh. Sterility is a common attribute of hybridism. In this respect, the Dukes behave like hybrids; most of the seeds being sterile, and in none are the seeds so fertile as in varieties known to be pure-bred as to species. So, too, shrunken pollen-grains indicate hybridity. A study of the pollen of Duke cherries shows many grains, the greater proportion, to be abnormal, a condition not found in the pollen of varieties true to species. Crosses between sweet and sour cherries at the New York Experiment Station have given many Dukes. May Duke, Reine Hortense, and Late Duke are the leading hybrid varieties.

There are dark-colored Duke cherries with reddish juice and light-colored sorts with uncolored juice, just as in the two parent species. May Duke is a typical variety with colored juice, while Reine Hortense is probably the best-known cherry among these hybrids with uncolored juice. There are about 65 cherries listed as "Dukes." The name Duke comes from the variety May Duke, which is a corruption of Médoc, a district in France, whence this variety came. The cherries of this group are known as Dukes only in England and the United States; in France, the name Royale is similarly used.

The Mahaleb Cherries

3. *Prunus Mahaleb,* Linn. St. Lucie Cherry. Perfumed Cherry. Tree small, slender, vigorous, open-topped; branches roughened, ash-gray over reddish-brown; branchlets numerous, slender and firm-wooded, dull gray, glabrous, with many large, raised lenticels. Leaves numerous, 1 inch in length, 1¼ inches wide, obovate, thick, leathery; upper surface glossy, smooth; lower surface light green; pubescent along the midrib; apex and base abrupt; margin finely crenate, with reddish-brown glands; petiole ½ inch long, slender, greenish, with 1-3 small, globose, greenish glands. Flowers appearing after the leaves, small, ½ inch across, white, fragrant; 6-8 scattered on a stem 1 inch in length; terminal pedicels ¼ inch long and basal pedicels ½ inch long. Fruit very small, round-ovate; suture a line; apex pointed, with stigma adherent; color black; flesh reddish-black, very astringent, sour, not edible; stone free, very small, ovate, with pointed apex; ventral suture prominent.

P. Mahaleb is a wild inhabitant of all southern Europe as far north as central France, southern Germany, Austria-Hungary; and eastward through Asia Minor and Caucasia to and within the borders of Turkestan. Wild or cultivated, the Mahaleb is a shallow-rooted plant, a fact that must be taken into consideration in its use as a stock. *P. Mahaleb* is a common escape from cultivation in eastern North America, especially about the nursery centers of central New York. The Mahaleb is of no importance to fruit-growers for its fruit, but as a consort with nearly all of the sweet and sour cherries now being propagated in North America, it becomes of prime importance and so receives consideration here. Mahaleb stocks are usually grown as seedlings, but may also be propagated from root-cuttings.

The Tomentose Cherry

4. *Prunus tomentosa,* Thunb. A dwarfish bush-like plant, vigorous, dense-topped, hardy; trunk and branches stocky; branches smooth, grayish-brown; branchlets many, thickly overspread with short pubescence, with short internodes. Leaves numerous, 2⅛ inches long, 1½ inches wide, obovate, velvety; upper surface dull, dark green, rugose; lower surface thickly pubescent, with a prominent midrib and veins; apex abruptly pointed; margin serrate; petiole 3/16 inch across; borne singly or in pairs; pedicels short, thick, glabrous. Fruit ½ inch in diameter, round; cavity deep, narrow, abrupt; suture shallow; apex depressed, with adherent stigma; color currant-red; dots numerous, small, gray, obscure; stem thick, ¼ inch in length, pubescent; skin thick, tender, covered with light pubescence; flesh light red, with light red juice, stringy, sprightly, sour; stone clinging, pointed, with smooth surfaces.

The habitat of *P. tomentosa* is central Asia, though it is now to be found growing spontaneously in East Tibet and eastern China. This shrub-like cherry is very generally cultivated in central, eastern, and northern China and in Japan for its fruit and as an ornamental. It has been introduced in many widely separated places in North America, and appears to be promising for cold regions. The plant is twiggy, close-jointed, usually with many stems springing from the ground which bear branches quite to the base. Frequently these low-growing branches bend to the ground and take root, forming new plants. The bushes are thickly clothed with leaves densely tomentose on the underside—in this respect and in shape very unlike the foliage of common cultivated cherries. The fruit ripens in midseason, setting profusely from the many blossoms. The cherries are a half-inch in diameter, bright currant-red, covered with inconspicuous hairs, are pleasantly acid, very juicy, and a great addition to cultivated cherries. *P. tomentosa* seems a most promising plant for domestication and of particular merit for small gardens.

Sand Cherry

5. *Prunus pumila,* Linn. Plant a shrub 5-8 feet in height, decumbent; trunk slender, smooth except for the raised lenticels; branches slender, smooth, twiggy,

dark, dull reddish-black with a tinge of gray; branchlets slender, twiggy, dull grayish-brown, glabrous, with small, raised lenticels. Leaves hanging late in the season, small, 1¾ inches long, 1 inch wide, flat, pointed, narrowly oblanceolate, thin; lower surface thinly pubescent on the midrib and veins; midrib small, straight; veins very minute; margin serrate, with teeth tipped with very small glands; petiole short, 1¼ inches in length, glandless. Flowers small, in 2- to 5-flowered umbels, white, appearing with the leaves; pedicels slender, ½ inch in length. Fruit round, pendulous, purple-black, without bloom, ½ inch in diameter; flesh thin, sour and astringent; season late; stone turgid, round.

The sand cherry, or dwarf cherry, of eastern America, is found on sandy and rocky inland shores from Maine to the District of Columbia and northwestward to the Lake of the Woods in Canada. It grows in light sands,—a fact which suggests its use in arid soils and especially on poor soils in cold climates. As yet there seem to be no named varieties of this cherry, since its nearly related species, *P. Besseyi,* offers greater opportunities to the fruit-grower. Both plants and fruits are so variable, the size, color, and quality of the crop on some plants being quite attractive, that it is certain that an opportunity is being overlooked to domesticate a worthy native plant. The species ought to have value, too, as a stock on which to work other cherries for sandy soils, dwarf trees, and exacting climates.

Western Sand Cherry

6. *Prunus Besseyt,* Bailey. Rocky Mountain Cherry. Plant a small spreading shrub, 1-4 feet in height; trunk slender, smooth; branches slender, smooth, very dark brownish-black, with numerous lenticels; branchlets slender, short, dull grayish-brown, smooth, glabrous, with small, raised lenticels. Leaves hanging late, numerous, small, 2⅜ inches long, 1 inch wide, thick, stiff; apex with a short taper-point, broadly lanceolate; upper surface dark green, glossy, smooth; lower surface light green; midrib distinct, glabrous; margin serrate, with teeth tipped with indistinct glands; petiole thick, ⅜ inch in length, glandless or with from one to two small, globose glands; stipules very prominent, almost leaf-like. Flowers appearing with the leaves in sessile umbels, small, less than ½ inch across, white. Fruit ½ inch in diameter, globose, oblong-pointed, yellow, mottled or purple-black; variable in flavor but always more or less astringent; stone large, globose, flattened.

This species is found on the prairies from Manitoba and Minnesota to southern Kansas and westward into Montana. In its natural range, it undoubtedly runs into that of *P. pumila* to the east, and some botanists believe that the two species grade into each other; but the two are as distinct as are many other of the more or less indefinite species of this genus. Although *P. Besseyi* has received attention from horticulturists for less than a quarter-century, it has aroused much interest, best indicated by the fact that now a considerable number of varieties of the species are under cultivation; and there are more than a score of hybrids disseminated in which it is one of the parents. The flesh is tender and juicy, and, while it is generally astringent, plants bearing aromatic and very palatable cherries are often found growing wild, and some of the domesticated plants bear very well-flavored fruits. The sand cherry is remarkably productive, and has remarkable capacity to withstand the vicissitudes of the exacting climate in which it grows. Fruits from different plants vary in size, color, and flavor,—a fact which suggests that, under cultivation, amelioration will proceed rapidly. The plants of this species root freely from layers or root-cuttings, and are, therefore, easily propagated and multiplied.

But it is in its hybrids that this cherry has proved most valuable in horticulture. There are now hybrids under cultivation between this species and the sand plum (*P. angustifolia Watsonii*), the Hortulana plum (*P. hortulana*), the Simonii plum (*P. Simonii*), the Japanese plum (*P. salicina*), the American plum (*P. americana*), the cherry plum (*P. cerasifera*), the sweet cherry (*P. avium*), the peach (*P. Persica*), the apricots (*P. Armeniaca* and *P. Mume*), and the common plum (*P. domestica*). This species seems to be the "go-between" of the many varied types of the genus Prunus.

The sand cherry makes a good stock for peaches, apricots, Japanese and native plums; and, while it does not so readily consort with the true cherries, yet it can be used as a stock for them. On the other hand, larger fruits of the sand cherry can be grown when it is budded on stocks of the American plum, *P. americana.*

CHAPTER VIII

VARIETIES OF APRICOTS

In America, the apricot is distinctly a Californian fruit; more than four million trees have been planted in that state. Indeed, it may be said that California has a monopoly of the apricot industry, furnishing America with fresh fruits and the whole world with the cured and canned product. Elsewhere in the United States, the apricot is grown for the occasional crop the trees may produce, but chiefly as an ornamental, for few other trees are handsomer than an apricot-tree with its dark-green, luxuriant, heart-shaped leaves and large white blossoms. Apricot-culture is confined to California on this continent for the reason that the blossoms appear so early—first of all tree-fruits—that elsewhere they are usually caught by spring frosts, so that the industry is precarious, indeed, except in favored California. The Russian apricots are not so often injured by frosts at blooming-time, but the fruits are hardly worth having after they are in hand. There is a great field for the development of late-blooming apricots for America. But thirty-three varieties of this fruit are described, and these less satisfactorily to the author than the varieties of any other fruits, since opportunities to study this fruit have been comparatively few.

ALBERGE. This is an old French sort so vigorous in growth that the tree is commonly used as a stock for other French apricots. For this purpose it is grown from seed, and since it comes nearly true to seed, there are many strains of the variety. The trees of all types are noted as prolific producers, and for their large size. The product of Alberge is very popular in Europe for drying and preserving. One of the strains is remarkable in France for its sweet kernels, which are said to be nearly as good as those of the best sweet almonds.

Tree large, vigorous, productive, hardy. Flowers midseason, 1½ inches in diameter, white. Fruit 1½ inches in diameter, round-oblate; suture very shallow; yellow or pale orange which is marked in the sun with many red spots; skin adherent, thick and rough; pubescence short, thin, fine; stem inserted in a deep, narrow cavity; flesh orange colored, firm, vinous, brisk subacid, perfumed; good in quality; stone large, flat, clinging to the flesh; kernel bitter.

ALEXANDER. Alexander is a Russian apricot recommended for the Middle West. It is not worth growing where better sorts thrive. Alexander is often confused with Nicholas. The history of the variety is unknown, but it has been grown in the United States for at least a generation.

Tree vigorous, upright, hardy, healthy, very productive, new growth markedly red; leaves large; petiole 1 inch in length, bearing several globose glands. Flowers large, white, very early. Fruit ripening in New York about August 1st; small, oblong, flattened; suture marked but not prominent; color light orange-yellow with a light flush; flesh orange-yellow, firm, coarse, juicy, sweet; poor in quality; stone large, free.

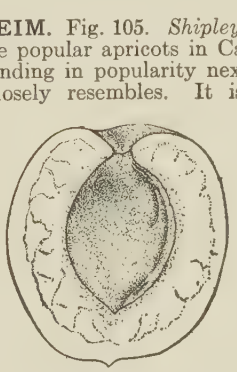
BARRY. This variety is listed by Wickson as desirable for the central coast valleys of California. As grown in some parts of California, Barry is identical with Royal. The fruit is described as follows by Lloyd Austin, a student in the University of California:

Fruit midseason; large, round, sides but little compressed; cavity medium deep; suture shallow; color pale orange, sometimes with a red cheek; flesh orange; quality good; stone large, round-oval, free; kernel bitter.

BERGETTI. This apricot is said by Wickson of California to be "an undetermined variety introduced by Mr. Bergetti and widely distributed under his name in the San Joaquin."

BLACK. This is the only variety of *Prunus dasycarpa*. It has little horticultural value, though it might be grown for the sake of variety in regions too cold for the apricots of commerce, since this sort is as hardy as an apple. It reproduces from seed. For a full description, see the discussion of the species on page 119.

BLENHEIM. Fig. 105. *Shipley*. Blenheim is one of the popular apricots in California for canning, standing in popularity next to Royal, which it closely resembles. It is grown in



105. Blenheim. (×½)

every part of the state where the apricot is grown. This is an old sort raised by a Miss Shipley, Blenheim, England. Shipley is no doubt the proper name, but the variety is so well established as Blenheim in the great apricot regions of California that it is not advisable to attempt a correction. Loose and Knobel are selected strains growing in Santa Clara Valley, California.

Tree vigorous, a regular and productive bearer, hardy. Flowers early, large, white. Fruit midseason; 2 inches in diameter, round-oblong or round-oblate, sides com-

pressed; suture well marked, deep at cavity; apex rounded; color golden-orange with a deep red blush; pubescence short, fine, obscure; stem very short; skin thin, tender, free; flesh deep yellow or orange, juicy, mild, sweet but not rich; stone of medium size, flat, ovate, free or clinging somewhat; pervious channel; kernel bitter.

BONGOUME. This is one of the few Japanese apricots grown in America for its fruits, but because of small size and poor flavor the fruits are hardly worth having. Its only merit is to add variety. It is more tender to cold than the peach or other apricots. The variety is recommended for the Gulf states.

Tree small, vigorous, productive, tender to cold. Fruit early; small or medium in size, round-oblong with a distinct point at the apex; cavity irregular, narrow, deep; suture distinct, halves unequal; skin greenish-yellow with a blush, finely pubescent or nearly smooth; flesh light yellow, melting, juicy, strongly subacid, sour at the pit and skin; fair in quality; stone large, clinging, thick, round-ovate, with point at the apex.

BREDA. The name has been used to designate several apricots during the last two centuries. The one here described is the variety now listed by English nurserymen, distinguished as an early sort of excellent quality. It is to be found in eastern American orchards, but seems not to be known on the Pacific slope. The origin of Breda does not appear in any available pomology.

Tree very vigorous, with strong-growing shoots, productive. Flowers early, large, white. Fruit early; 1½ inches in diameter; round-oblate, compressed, halves equal; cavity deep, flaring; suture shallow, becoming deep at cavity; apex small, flattened; color light orange-yellow with a handsome blush deepening about the cavity; pubescence obscure; many red dots; skin thick, tough, free; flesh rich orange, juicy, coarse, stringy, sweet; good; stone free, small, round-ovate, winged, smooth; kernel sweet.

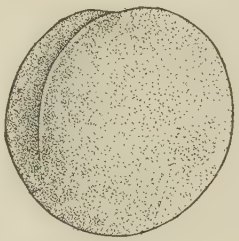
BUDD. Budd has the doubtful recommendation of producing the best fruits of all the Russian apricots. The crop ripens very early, and the fruits have a sweet peach-like flavor that recommends them to those who are looking for variety. Budd is grown only in the Middle West, where it was introduced a generation ago by J. L. Budd, the noted authority on Russian fruits. The variety is not gaining in popularity.

Tree vigorous, upright, hardy, productive. Leaves glandular. Fruit very early; small, oval, flattened; suture deep; halves unequal; skin golden-yellow, tinged with red on exposed sides; flesh bright orange, coarse, stringy, juicy, firm, sweet, peach-like in flavor; good; stone cling or half-cling, rather large.

EARLY GOLDEN. Wickson reports on this variety in California as follows:

"Origin unknown; small, roundish oval, with suture well marked and extending half way round; skin smooth, pale orange; flesh yellow, moderately juicy and sweet, with very good flavor; separates from the stone. This variety is reported favorably from some counties, but generally otherwise, and is not largely grown. Ripens before Royal."

EARLY MOORPARK. Fig. 106. Early Moorpark is one of the standard early apricots East and West, and is very popular with the apricot-growers in southern California. The fruits resemble those of Moorpark, best known of all apricots, in shape, color, and quality, but are smaller and appear three weeks earlier; they are choicely good in quality but are a little too small for the market. The crop ripens soon after the middle of July at Geneva,



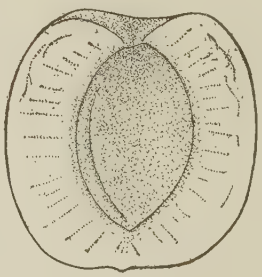
106. Early Moorpark. (×½)

New York. The trees are very productive, but are tender to cold, and the crop ripens unevenly in some situations. This is a good variety to try in the East because of extreme earliness. Early Moorpark is an old English variety.

Tree vigorous, hardy, healthy, productive, with strong, luxuriant shoots. Fruit very early; small, round-oval, with a well-marked or deep suture extending from base to apex; skin lemon-yellow flushed and dotted with bright reddish-orange; very juicy, sweet and rich; of best quality; stone free from the flesh, round-oblong, rough; kernel bitter.

GIBB. Gibb is another of the comparatively worthless Russian sorts, but may be of value in the Middle West. The fruit is somewhat larger than that of other Russians, ripens about the latest of the Russians, and is fair in quality. But few nurserymen offer the variety, and it is likely soon to be a fruit of the past. Gibb has been grown for a generation, but when, where, and by whom originated does not appear, although it was evidently named after the great Canadian authority on Russian fruits.

Tree large, vigorous, upright, hardy, productive. Leaves very large with a long gland-bearing stem. Fruit ripening August 1st at Geneva, New York; small, round; apex acute; suture well-marked but not deep; skin light yellow, with a trace of color in the cheek to the sun; flesh yellow, juicy, subacid; rather poor; stone medium to large, free, oval.



107. Hemskirke. (×½)

HEMSKIRKE. Fig. 107. This variety is a strain of Moorpark, which it surpasses in hardiness of tree. The tree resembles that of Moorpark in wood and foliage, but is a more regular

PLATE VI.—ELBERTA PEACH.

bearer; unfortunately it does not hold the crop well. The fruit, also, resembles that of Moorpark, but ripens evenly on both sides, as Moorpark often does not. The variety is widely grown in California under the name Hemskirke. It is an old English sort.

Tree large, spreading, very hardy and healthy, regular and productive bearer. Flowers large, nearly pure white. Fruits midseason; large, nearly 2 inches in diameter, round or round-oblate, sides compressed, bulged on one side of suture near the apex; suture distinct; apex mucronate; color orange with brown spots, blushed toward the sun; skin thick, adhering; flesh golden-orange, tender, juicy, rich; very good in quality; stone oval, small, free; with a pervious channel; kernel bitter.

JAPAN. Under this name the Japanese apricot, *Prunus Mume,* is offered by several southern nurserymen. One of these catalog descriptions runs as follows:

"This is the earliest, largest, and best apricot in cultivation, and the only apricot that is a success here in central Louisiana; fruit clear bright yellow, fine flavor; tree a straggling grower and an abundant bearer. It was imported by ex-Governor Hubbard, of Texas, while minister at Japan."

KAISHA. This interesting sort with red flesh was introduced from Syria in 1842 into England, where it has been grown more or less since. Toward the close of the century it was imported to America, and is to be found sparingly in eastern plantations. Apricot-growers in California have either not tried Kaisha, or else discarded it as unworthy—probably the latter. The tree is somewhat unsatisfactory, being tender to cold, blooming early, and bearing lightly and unevenly. As grown at Geneva, New York, the fruit is described as follows:

Fruit early; small, round-oblong; cavity small; suture distinct; skin rich yellow with a few red dots; flesh deep red, stringy, juicy, sweet; poor in quality; stone large, free, rough, obovate, base terminating in a flat, broad point.

LARGE EARLY. Fig. 108. This is an especially valuable variety because of the earliness, large size, attractive appearance, and

108. Large Early. (×½)

high quality of its fruits. The variety is a favorite in nearly all apricot-growing regions. A fault is that the tree is sometimes an uncertain bearer. Large Early is an old French variety.

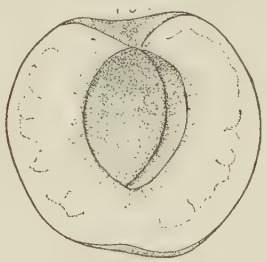
Tree vigorous, spreading, hardy, productive but sometimes uncertain in bearing. Leaf large, broader than long; margin coarsely serrate; petiole ¾ inch long, with 1 to several globose glands. Flowers white, often with 6 petals. Fruit very early; nearly 2 inches in diameter, oblong-oval, compressed, often oblique; suture well marked; apex terminating in a sharp point; color light orange, darker orange next to the sun with some red; fine obscure pubescence; flesh orange, firm, juicy, sweet, rich; very good to best; stone free, oval, flat with sharp point; kernel bitter.

LARGE EARLY MONTGAMET. This is probably a European sort renamed. It is offered for sale by California nurserymen, and is to be found occasionally in eastern America. As grown at Geneva, New York, the fruit is described as follows:

Fruit early; large, 2 inches or more in diameter, round-oval, sides compressed, irregular, ribbed, truncate; cavity large and deep; suture distinct, dividing a prominent swollen ridge; color rich yellow or orange, mottled or blushed with red; flesh deep yellow, juicy, firm, sweet, rich; quality very good; stone large, free, nearly as broad as long, thick, rough, very dark in color; kernel sweet.

LATE ENGLEHARDT. This apricot, grown only in California, is described by Wickson as follows:

"Chance seedling originated at La Crescenta. Propagated and introduced by W. B. Thorne of Tropico. Large as Moorpark, ripening evenly and twenty-eight days later than Royal. Claimed to be a very late bloomer, and thus escaping frosts which caught all other varieties at similar elevations. Planted chiefly in Los Angeles County."



109. Luizet. (×½)

LUIZET. Fig. 109. Luizet is an old French sort little grown in America, but offered by several American nurserymen. Wickson says it is approved in the upper San Joaquin Valley, California. The fruit is a fine, early apricot at Geneva, New York, as the following description shows:

Fruit early; very large, round-ovate, sides a little compressed toward the apex; suture prominent, dividing a swollen ridge; halves of the fruit unequal; cavity broad, deep; color a deep rich yellow with a crimson blush and dots of crimson; flesh deep yellow, firm, juicy, aromatic, sweet, rich; very good in quality; stone large, round-ovate, free, rough, variable in thickness; kernel bitter.

MONTGAMET. *Alberge de Montgamet.* This is an old French sort which seems not to be known in eastern America. Wickson says it is grown in the Vacaville district of California. Hogg, the English pomologist, describes it as follows:

"Fruit of small size, oval, somewhat compressed on the sides, and marked with a shallow suture; skin pale yellow, with a slight tinge of red on the side next to the sun; flesh yellowish, firm, adhering to the stone,

juicy and agreeably acid, but when well ripened it is highly perfumed; stone impervious, roundish; kernel bitter."

MOORPARK. Fig. 110. Moorpark is probably the most widely and the most frequently grown of all apricots. Some English horticulturists say that Peach and Moorpark are identical, but the majority believe that there are two distinct varieties under these names. The merits of the variety are chiefly to be found in the fruits, which are of largest

110. Moorpark. (×½)

size, handsome appearance, and best quality; they have long been the standard of excellence in both appearance and quality. The trees have several faults: they are a little tender to cold; are uncertain and irregular bearers; and the crop ripens unevenly. This is a favorite variety in some of the California apricot regions, but is not popular in southern California. Moorpark is an old English variety, but is said to have been introduced from France to England at an early date.

Tree very large, with long, strong shoots, tender to cold, sometimes very productive, but often shy and uncertain and not always healthy. Fruit large, more than 2 inches in diameter, round with truncate base and compressed sides; cavity small; suture shallow, dividing the fruit into unequal halves; color pale orange, deeper orange and a distinct blush on side next to sun, with brown and red dots; flesh deep orange, firm, juicy, sweet, rich; best in quality; stone free, large, rough, thick; kernel slightly bitter.

NEWCASTLE. Several valuable apricots have originated in California which meet local conditions rather better than foreign sorts. One of the best of these is Newcastle, which sprang up in Newcastle, Placer County, in 1881. Its especial value is in the earliness of its fruits, which are three to four weeks earlier than Royal, although the trees have the merits of being productive and regular bearers. Newcastle grows as follows in New York:

Tree of medium vigor; upright in growth, productive. Fruit very early; round-oblate, smaller than Royal; cavity deep, narrow; suture shallow or a line, deep at the cavity; color lemon yellow, darker on the side to the sun with a blush of red; pubescence fine, obscure; skin thick, tough; flesh deep yellow, juicy, firm, tender, sweet, rich; quality very good but not as good as Royal; stone free, large, flat, ovate, pitted.

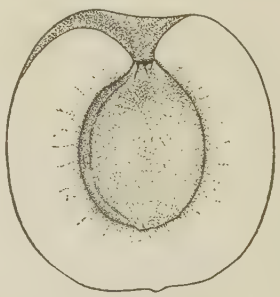
OULLINS EARLY. Oullins Early was introduced from Oullins, France, but Le Roy, one of the best French pomologists, says it is identical with Moorpark. Hogg, the English pomologist, says it is an early form of the Peach apricot, a variety very similar to Moorpark. Wickson, a Californian authority, agrees with Hogg, and says it "ripens in Amador county four weeks earlier than Peach." On the grounds of the New York Agricultural Experiment Station, Geneva, New York, three distinct peaches have grown under this name. With this confusion, the author hesitates to describe the variety.

PEACH. This is one of the oldest and best-known apricots, having been grown in France for at least three centuries. As might be expected with so old a variety, and a name so likely to be used, there is much confusion in the apricots passing under this name. The one here described is the apricot accepted for this name by Hogg, who says it is very similar to Moorpark but not identical. This is probably the apricot grown under this name in California, where the fruit has been a favorite in the Sacramento Valley for canning and drying, but is being discarded because the crop ripens too rapidly, and the conserved product is inferior in appearance. The following is Hogg's description:

"Fruit large, oval, and flattened, marked with a deep suture at the base, which gradually diminishes towards the apex; skin pale yellow on the shaded side, and with a slight tinge of red next the sun; flesh reddish yellow, very delicate, juicy, and sugary, with a rich and somewhat musky flavor; stone large, flat, rugged, and pervious along the back; kernel bitter."

ROUTIER PEACH. Apricot-growers of California speak very highly of this variety, which seems to be especially valuable in Sacramento and San Joaquin valleys. A notable characteristic is that the tree blooms a week later than that of Peach, which was probably its parent. The variety originated near Sacramento, California, with Joseph Routier nearly a generation ago. The fruit is described by Wickson as follows:

"Large, yellow in the shade; deep orange, mottled and splashed with red in the sun; flesh juicy and rich, high flavor and a good market variety." The tree is reported as being especially satisfactory in the regions in which the variety is grown.



111. Royal. (×½)

ROYAL. Fig. 111. Royal is now the leading apricot in the great apricot-growing regions of California. In quality of fruit, it is somewhat inferior to Moorpark, but the trees do not have the several serious faults of

Moorpark. Besides furnishing an excellent product for shipping as a fresh fruit, Royal supplies canners and dryers with a favorite product. In addition to the variety, there seem to be two quite distinct strains of Royal in California. The Derby Royal is like the type variety, but is two weeks earlier. White Royal is lighter in color and flesh; this strain is not liked by canners. Royal and Blenheim are almost indistinguishable, though the latter is larger. The variety is an old European sort.

Tree large, vigorous, regular in bearing large crops which ripen uniformly. Fruit midseason; large, oval, sides compressed; suture shallow but distinct; color pale yellow or orange with orange cheek tinged with red with a few red dots; flesh rich, dull, yellow, firm, juicy, vinous; very good in quality; stone large, free, round-oblong, thick, rough; kernel bitter.

SHENSE. Fig. 112. *Acme.* A letter on file at the New York Agricultural Experiment Station, Geneva, New York, from Professor J. L. Budd, Ames, Iowa, noted as an authority on Russian fruits, says that Shense is by far

112. Shense. (×½)

the hardiest Russian apricot; that the tree is vigorous, handsome, productive, and the fruit large and of good quality in Iowa and Nebraska. In the last-named state, the variety is grown under the name Acme. Shense originated from a stone brought from China about 1883. The fruit appears as follows in New York:

Fruit early; large, 2 inches in diameter, round, compressed; suture distinct; color pale yellow, the half exposed to the sun overspread with intense red deepening to purple; flesh deep yellow, juicy, mild subacid, pleasant; good in quality; stone large, free, ovate.

SMYRNA. Smyrna is grown on the grounds of the Experiment Station, Davis, California. The following description of the fruit is sent by Lloyd Austin, a student specialist in apricots:

Fruit midseason; large, round-oval, slightly conical, sides compressed; cavity shallow; suture medium to deep; color yellow or pale orange; flavor distinctive and very pleasing; stone free, medium in size, oval, plump; kernel sweet.

SPARK MAMMOTH. In the sixth edition of *California Fruits,* Wickson says of this variety:

"Popular in Ventura County. Largest size, even larger than Moorpark; pale yellow, very tender, juicy and sweet; abandoned for shy bearing."

ST. AMBROISE. Fig. 113. The tree of St. Ambroise is accredited as being most productive and very good in other characters as well, but the fruits are a little coarse, lacking in

113. St. Ambroise. (×½)

richness of flavor, and not well adapted for either canning or drying, although they ship well in the fresh state. The variety is grown more or less in the interior valleys of California, but is not liked near the coast. St. Ambroise is an old European variety.

Tree vigorous, hardy, healthy, very productive. Fruit early; large, more than 2 inches in diameter, oblong-elliptical, sides compressed, suture side swollen, ribbed at base; suture distinct; color deep, rich yellow, blushed next the sun; a few reddish dots; flesh rich yellow, firm, a little stringy, melting, juicy, perfumed; very good in quality; stone free, very large, rough, elliptical, flat, winged.

TILTON. Wickson, pomological authority of California, says of this variety:

"Chance seeding first noticed about 1885 on place of J. E. Tilton, near Hanford, Kings County, and distinguished by regular bearing. Propagated and introduced by J. W. Bairstow, of Hanford. Fruit large; freestone; symmetrical, prolific. Widely planted recently and very promising, though condemned for shy bearing in some places. Colors in advance of ripening and is often picked too green for best quality in drying."

TOYAHVALE. This is a Russian apricot recently introduced by the Texas Nursery Company, Sherman, Texas. It was grown from seed planted by C. W. Giffin, Toyahvale, Texas, in 1899. The introducer describes the variety as follows:

"Blooms very late, hence sure; very prolific. Medium size, yellow, fine flavor. The original tree stands 2 feet in diameter of trunk, 50 feet spread of limbs, bearing enormously."

WIGGIN. Wickson, writing of this variety in California, says it is favored in the Winter's district as the best of early apricots. He characterizes the fruits as of "good size, fine color, solid red cheek, ten days earlier than Royal." The trees, Wickson says, are "good bearers." The origin of the variety is not given.

CHAPTER IX

VARIETIES OF CHERRIES

Although the cherry seems to have been domesticated as early as any other of the tree-fruits, the cultivated cherry is now more like its wild progenitor than any other inhabitant of the orchard. The cherry, of all hardy fruits, excepting, perhaps, the Insititia plums, is also most fixed in its characters: as a consequence, the differences between tree and fruit in the varieties are less marked, and the varieties come more nearly true to seed. In spite of these facts, there are a great number of varieties:—the author described 1145 in *The Cherries of New York*. The sorts included in this chapter are varieties now under cultivation, for most part those on sale by nurserymen in 1920. All the full descriptions have been made from trees growing on the grounds of the New York Agricultural Experiment Station, Geneva, New York.

ABBESSE D'OIGNIES. Fig. 114. *P. Avium* × *P. Cerasus.* Abbesse d'Oignies has so many good characters that it is well worth trying commercially wherever good cherries are grown in the United States. It seems so far to have been tried only in the Middle West, where Professor Budd introduced it in Iowa from Russia in 1883. Here in the unfavorable soil and climatic conditions of the Mississippi Valley, Abbesse d'Oignies grows as well as any cherry of its class. The trees are large, vigorous, hardy, fruitful, and free from fungous diseases. The cherries are large, dark red, of most excellent quality, combining the flavor of the Dukes with a firmer and tenderer flesh. The high quality, handsome appearance, and good shipping qualities of the fruit, combined with the excellent characters of the trees, ought to make Abbesse d'Oignies a very good commercial variety. This cherry originated in Belgium about the middle of the nineteenth century.

114. Abbesse d'Oignies. (× 1)

Tree characteristically large and vigorous, upright-spreading, round-topped but with drooping branches, hardy, productive. Leaves 2½ inches wide, 5½ inches long, obovate, thick; margin with small black glands, coarsely and doubly serrate; petiole 1¼ inches long, thick, lightly tinged with red, grooved, with one or two small, globose, reddish-orange glands. Flowers mid-season, white, 1¼ inches across; borne in dense clusters at the end of spurs or spur-like branches, varying from one to three. Fruit late; ¾ inch long, 1 inch thick, round-oblate, slightly compressed; cavity wide, regular; suture a line; apex rounded, slightly depressed; color dark red; dots numerous, light russet, conspicuous; stem slender; colorless juice, stringy, tender and soft, sprightly subacid; of very good quality; stone free, round, turgid, slightly pointed, with smooth surface; ridged along the suture.

ABUNDANCE. *P. avium.* Abundance is a seedling of the well-known Napoleon, or Royal Ann, as it is called in the Pacific states. The seedling closely resembles the parent in fruit and tree. The variety is grown only in California and Oregon, and in these states growers maintain that the fruit is larger than that of Napoleon and the tree a stronger grower and more productive. The season is about the same. On the grounds of the New York Agricultural Experiment Station, Geneva, New York, it is difficult to tell the fruit of the seedling from that of the parent. The description of Napoleon will answer for that of Abundance. The variety originated with Luther Burbank, Santa Rosa, California, and was first mentioned in his catalog for 1911-12.

BALDWIN. *P. Cerasus.* On the grounds of the New York Experiment Station, Baldwin trees which came direct from the originator turned out to be Olivet. The published descriptions are so scant and fragmentary that it cannot be made out whether the variety is distinct or is Olivet renamed. The variety has been widely disseminated in the Middle West, but has not shown much merit either for home or for commercial orchards in the rather lengthy probational period it has had in the East. Baldwin is supposed to have grown on the farm of S. J. Baldwin, Seneca, Kansas, from a sprout of a stock on which Early Richmond had been budded, and first fruited in 1891. The description is a compilation.

Tree vigorous, round-topped; leaves large, broad; flowers white, changing to pink. Fruit ripens early; usually borne in pairs; large, round; stem of medium length, rather thick; color very dark red, yet almost transparent; flavor slightly acid, yet considered one of the sweetest and richest of the Morello class.

BELLE DE CHOISY. *P. avium* × *P. Cerasus. Choisy.* The fruits of Choisy are handsome and delicious—about the best of all dessert cherries, delicately combining the richness of the sweet and the sprightliness of the

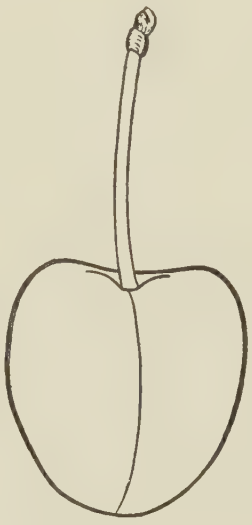
sour cherry. Unfortunately, while the trees bear early and regularly, they are seldom fruitful; to offset this fault, however, they are vigorous, hardy, and healthy. The cherries keep and stand the wear and tear of marketing as well as those of any other Duke. All characters of Choisy commend it for the home orchard and for a local market. In particular, it may be recommended for cold climates where a true sweet cherry is not quite hardy, as this hybrid is nearly as hardy as the other parent, a sour cherry. Choisy was cultivated in France as early as 1628. It was first described in America in 1832.

Tree large, vigorous, spreading, open, hardy, but moderately productive. Leaves numerous, very broad, obovate, rather abruptly pointed; margin deeply and regularly serrate to rather dentate. Flowers early, white, large, numerous, borne in large clusters. Fruit midseason; usually attached in pairs, large, round-oval, flattened toward the base; cavity shallow, wide; suture shallow, indistinct; apex depressed; color bright red mottled with yellow and amber; stem thick at the base, 1½-2 inches long, generally forking at about ½ inch from the base; skin thin, firm, semi-transparent, showing the netted texture of the pulp beneath; flesh pale amber, with abundant colorless juice, tender, melting, sweet; very good in quality; stone small, round, pointed at the apex; surfaces nearly smooth.

BESSARABIAN. *P. Cerasus.* Bessarabian has a place in home orchards in the colder parts of the Mississippi Valley and the Great Plains. It is very hardy and is said to thrive even under neglect, standing as much abuse as a forest tree. As compared with standard commercial cherries of the East, the fruit is distinctly inferior in size and quality, hardly fit to eat out of hand, and is sour and astringent even when cooked. The trees are hardy and healthy, but dwarfish and not productive because of the smallness of the cherries. It is an early cherry, but the fruit hangs long. The variety is said to root well from cuttings. If this is true, it might be worth trying as a stock. Bessarabian is a variant of English Morello, brought to America from Russia about 1883 by Professor J. L. Budd, Ames, Iowa.

Tree of medium size, upright, becoming somewhat spreading, compact, healthy, unproductive, very hardy; branches drooping, long, slender. Leaves abundant, medium to small, oval, coarsely serrate, dark green, broad, flat; glands few, on the stalk at the base of the leaf. Fruit early, remaining on the tree a long time in good condition; medium in size, round-oblate to cordate, irregular, bright red becoming dark red; stem long, varying from 1¾ to 2 inches in length, slender, curved; skin tender; flesh light to dark red, with abundant colored juice, variable in firmness, sprightly subacid, becoming milder when fully ripe; fair in quality; stone round-oval, semi-clinging.

BING. Fig. 115. *P. avium.* Bing is one of the best of the several very good cherries from the Pacific Northwest. The fruits are almost unequalled in size, attractiveness, and quality. Other characters commending the variety are that the crop hangs well on the trees and ripens at one time, so that the harvest consists of but one picking. Unfortunately, in the East the trees are not so vigorous, healthy, or productive as they should be in a commercial variety of first rank. The variety, though comparatively new, is no longer on probation. It deserves a place in the collection of every amateur, by virtue of its excellent fruit; and, where it is happy in soil and climate, is bound to become one of the leading commercial cherries. Seth Lewelling, Milwaukee, Oregon, grew Bing from the seed of Republican in 1875.



115. Bing. (×1)

Tree large, vigorous, erect, becoming upright-spreading, open, productive. Leaves abundant, large, obovate; margin slightly serrate, glandular; petiole long, pubescent, thick, tinged with red, with 1-3 large, reniform, reddish glands on the stalk. Fruit midseason or later; 1 inch in diameter, broadly cordate, somewhat compressed, slightly angular; cavity deep, of medium width, abrupt, regular; suture a dark line; apex rounded or slightly depressed; color very dark red, almost black; dots small, russet, inconspicuous; stem 1¼ inches long; skin tough, adherent to the pulp; flesh purplish-red with dark purple juice, rather coarse, firm, very meaty, brittle, sweet; of very good quality; stone semi-free, large, oval, blunt, with smooth surfaces.

BLACK EAGLE. *P. avium.* In many respects, Black Eagle is one of the best varieties of its species. The trees are usually fruitful; ripen their crop at a good time in the cherry season, just after Black Tartarian; and are as hardy, healthy, and vigorous as those of any sweet cherry. But it is high quality of fruit that gives Black Eagle such merit that it ought not to be forgotten; makes it worthy a place in every home orchard, and commends it highly to commercial growers of cherries who want a finely finished product for either local or general market. The fruit-stems of this variety are characteristically long. Black Eagle was grown about 1806 by Thomas Andrew Knight, Downton Castle, Wiltshire, England, from seed of Yellow Spanish fertilized with pollen of May Duke.

Tree large, vigorous, upright-spreading, dense, unproductive at first but improving with age. Leaves numerous, 5 inches long, 2½ inches wide, elliptical, thin; margin coarsely and doubly serrate, with dark glands;

petiole nearly 2 inches long, tinged with red, with a few hairs, with 2-4 reniform, brownish glands on the stalk. Flowers midseason; white, 1⅛ inches across; borne in scattered clusters in twos and threes. Fruit midseason; 1 inch in diameter, oblate, somewhat cordate, compressed; cavity regular, flaring; suture a faint groove; apex pointed or slightly depressed; color dark red almost black; dots small, russet, medium in number, obscure; stem slender, 2 inches long; skin thin, tender; flesh dark red, with wine-colored juice, meaty, tender, crisp, pleasantly flavored, mild, sweet; very good to best in quality; stone free except along the ventral suture, small, ovate, slightly flattened, blunt, with smooth surfaces.

BLACK HEART. *P. avium.* Although one of the oldest cherries under cultivation, Black Heart is still largely grown the world over. Prince, in 1832, said that it was more widely known than any other cherry in the country. While this statement would not hold for Black Heart now, it is still, because of the fruitfulness of the tree and the high quality and beauty of the fruit, a variety of much merit. Black Heart fails in commercial fruit-growing since the fruit does not meet market demands because of two defects: it does not ship well; and, when brown-rot is rife, it quickly succumbs to this fungus. This cherry was mentioned by John Rea in 1676, but without doubt it originated many years previous to that date.

Tree large, very vigorous, tall, wide-spreading, productive. Leaves very large, oblong, waved, acuminate, nearly flat; petiole of medium length, lightly tinged with red, with greenish glands. Flowers very early, medium in size. Fruit early, season long; large, obtuse-cordate, somewhat compressed; cavity broad; suture deep; surface somewhat irregular; color dark purple becoming black; stem 1¾ inches long, slender; skin slightly shrivelled; flesh dark red, firm to very firm becoming tender at full maturity, with abundant, colored juice, sweet; good in quality; stone large, round-ovate; dorsal suture deep.

116. Black Tartarian. (×1)

BLACK TARTARIAN. Fig. 116. *P. avium. Tartarian.* Black Tartarian is a favorite dooryard and roadside sweet cherry, and ranks second or third among commercial cherries for the whole region east of the Mississippi. The preëminently meritorious characters which give it so high a place in cherry culture are: the elasticity of its constitution, whereby it adapts itself to widely different soils and climates; the fruitfulness, healthfulness, and robustness of the trees, which also bear regularly, live to an old age, and grow to a prodigious size; comparative freedom from the worst of cherry diseases, brown-rot; lastly, the cherries, though not large, are tempting to the eye, and are a delight to the palate, the handsome purplish-red flesh being firm and crisp, yet juicy, with a sweet, rich flavor which gives the quality the rank of "very good to best." Unfortunately, this cherry is a little too soft to handle well in harvesting and marketing, or to hold its shape as a canned product; the small size is also against it for the canner's trade. The several defects noted prevent Black Tartarian from taking first rank in commercial orchards, but for the home plantation it is one of the best. Black Tartarian was introduced into England in 1794 from Circassia. It owes its introduction into this country to William Prince, Flushing, Long Island, probably in the early part of the nineteenth century.

Tree characteristically large, vigorous, upright, vasiform, productive. Leaves numerous, 5½ inches long, 2½ inches wide, obovate to elliptical, thin; margin varies from serrate to crenate; petiole 2 inches long, thick, tinged with red, with a few hairs, with 1-3 reniform, reddish glands on the stalk. Flowers white, 1¼ inches across, borne in clusters in twos and threes. Fruit early; 1 inch in diameter, cordate, compressed; cavity intermediate in depth and width, flaring; suture indistinct; apex pointed and slightly depressed; color purplish-black; dots numerous, small, russet, obscure; stem slender, 1½ inches long, adherent to the fruit; skin thin, separating readily from the pulp; flesh purplish-red, with dark-colored juice, firm, meaty, crisp, pleasant flavored, mild, sweet; of very good quality; stone free, ovate, slightly flattened and oblique, with smooth surfaces.

BOURGUEIL. *P. Cerasus.* Bourgueil is of the Montmorency type, hardly differing enough in fruit from Large Montmorency to be distinguished from it; and yet, since the tree seems to be more productive, Bourgueil is possibly worth adding to the cherry flora of the country. The variety is still on probation, but if trees true to name can be obtained, it is worth planting where growers want a cherry of the Montmorency type. The United States Department of Agriculture received this variety from France in 1905, and, in turn, forwarded it to several experiment stations, at which it has been fruiting for the past few seasons.

Tree vigorous, upright-spreading, vasiform, productive. Leaves numerous, 4 inches long, 2 inches wide, ovate, thick; margin doubly crenate; petiole 1 inch long, thick, with a dull tinge of red, pubescent, with 1-3 globose, yellow or brownish glands on the base of the blade. Flowers late, white, 1¼ inches across; borne in clusters, usually in threes. Fruit midseason; ¾ inch long, 1 inch wide, oblate, somewhat compressed; cavity deep, wide, medium flaring, regular; suture indistinct; apex roundish to flattened; color bright red; dots small, russet, inconspicuous; stem stout, 1⅛ inches long, adherent to the fruit; skin tender, free; flesh yellowish-white, with colorless juice, tender and melting, sprightly, sour; of good quality; stone free, large, round-ovate, pointed, with smooth surfaces, tinged with red, with a prominent ventral suture.

BRUSSELER BRAUNE. Fig. 117. *P. Cerasus.* Brusseler Braune has little value for commercial plantings. The trees are uncertain in bearing; the cherries are small, sour, and astringent; and the crop ripens very unevenly. It is of the English Morello type, but is far inferior to this well-known sort. Brusseler Braune has been much advertised for cold climates, but there are many better cherries that stand cold quite as well, and are better in both tree- and fruit-characters. The variety has two marked peculiarities: the leaves on

the two-year-old wood are very small, and the fruit-stems bear a small leaflet at their base. These leaflets on the fruit-stem would have to be removed in marketing the crop—another serious defect. No doubt Brusseler Braune originated more than a hundred years ago in Holland.

117. Brusseler Braune. (×1)

Tree of medium size, vigorous, upright-spreading but with drooping branchlets, dense, round-topped, unproductive. Leaves 3½ inches long, 1¾ inches wide, obovate, thick, grooved along the midrib; margin finely and doubly serrate; petiole 1 inch long, with 1-4 small, globose, yellowish-green glands. Flowers late, 1 inch across, white; borne in scattering clusters in threes and fours. Fruit very late; 1 inch in diameter, variable in size, round-cordate, compressed; cavity of medium depth, marrow, abrupt; suture very shallow, indistinct; apex rounded, with a small depression at the center; color light red changing to dark red as the season advances; dots numerous, small, dark russet, inconspicuous; stem 2¼ inches long, with small leaflets at the base, strongly adherent to the fruit; skin thin, tender, separates readily from the pulp; flesh dark red, with dark-colored juice, tender and melting, somewhat astringent, sour; of fair quality; stone nearly free when fully mature, round-oval, plump, blunt-pointed; surfaces smooth.

BUNTE AMARELLE. *P. Cerasus.* So far, Bunte Amarelle has found a place only in the trying climate of Iowa and neighboring states. The fruit is not attractive enough in appearance nor good enough in quality; nor is the tree certain and fruitful enough in bearing to compete with other Amarelles. The saving grace of Bunte Amarelle is extreme hardiness of tree; this with vigor and health, makes it desirable in the cold prairie regions of the Great Plains, where cherry-growing is more or less precarious. The variety probably originated in Germany in the latter part of the eighteenth century.

Tree vigorous, hardy; foliage large, coarse. Fruit matures the second week in June; medium to large, roundish, flattened at the base; cavity variable in depth; suture shallow, indistinct; apex depressed; color yellow overspread with light red; stem green, straight, slender, 1½-2 inches long; flesh slightly colored, juicy, firm but tender, pleasantly subacid; very good in quality; stone variable in size, broad.

BURBANK. *P. avium. Burbank Early.* This is a comparatively new cherry from Luther Burbank, Santa Rosa, California. The variety has been generally tested in California, and all agree that it has some commercial value. As yet, Burbank is on probation in the East. The large leaves protect the fruit from birds, and keep it from cracking in late spring rains. Burbank was introduced by its originator in 1911.

The variety is described as having vigorous trees, which are certain in bearing, erect in habit and bear very large leaves. The fruit is said to be very early, large, yellow with red cheek in the sun; flesh yellow, firm, very sweet; quality good to best; pit very small and clinging somewhat.

CARNATION. Fig. 118. *P. Cerasus.* Carnation is one of the Amarelles, similar to Montmorency except in color of fruit, in which character it is more pleasing than the better-known sort. The stone separates from the pulp very readily, leaving the flesh unusually bright and clean. Because of their sprightly refreshing flavor, the cherries are pleasing to the palate, as well as attractive to the eye. Unfortunately the trees are but moderately vigorous and fruitful, and these qualities count so heavily against it as a commercial cherry that Carnation cannot be more than a fruit for amateurs unless under exceptional conditions. Carnation is another of the choicely good, old cherries, being first mentioned in England by John Rea in 1676.

118. Carnation. (×1)

Tree medium in size, spreading, becoming drooping, not very productive. Leaves very numerous, 4 inches long, 2 inches wide, folded upward, oval to obovate, thin; apex acute; margin finely and doubly serrate, glandular; petiole 2 inches long, slender, dull red on the upper surface, with two large, reniform, reddish glands on the stalk. Flowers white, 1¼ inches across; borne in scattered clusters in twos and threes. Fruit matures in midseason; ¾ inch long, 1 inch thick, round-oblate, compressed; cavity deep, abrupt; suture indistinct; apex flattened; color medium to dark red; dots numerous, small, russet, inconspicuous; stem 1½ inches long, adherent to the fruit; skin tender, separating readily from the pulp; flesh yellowish-white, with abundant colorless juice, tender and melting, sprightly; quality very good; stone free, round, blunt, with smooth surfaces.

CENTENNIAL. *P. avium.* In California, Centennial is passing from the period of probation to one of general acceptance as a standard variety. It has not been well tested in the East, but trees growing in a commercial orchard at Geneva, New York, show the variety to be a close competitor with its parent, Napoleon. In some respects the fruits surpass those of Napoleon. The cherries are larger, sweeter, better-flavored, and have smaller pits. The trees fall short, however, of those of its well-known parent, in being less fruitful. The two varieties under comparison may be further distinguished by the more oblate fruits of Centennial, by a more mottled color, and by the pits, which are longer and more pointed in the newer variety. The variety is recommended for home orchards and experimentally for commercial plantations. Centennial was grown by Henry Chapman, Napa, California; it came in fruit in 1876.

Tree large, vigorous, upright-spreading, open-topped, productive. Leaves numerous, large, flattened, long-oval,

thick; margin coarsely serrate, with small and inconspicuous glands; petiole 1¼ inches long, pubescent, tinged with red, 2-4 large, reniform, greenish-red, flattened glands, usually on the stalk. Flowers 1¼ inches across, usually arranged in twos and threes. Fruit midseason, length of season short; very large, short-cordate, compressed; cavity deep, wide; suture distinct, broad, shallow; apex roundish or slightly depressed; color amber-yellow, speckled and overlaid with crimson; dots white, inconspicuous; stem thick, 1¼ inches long, adherent to the pulp; skin thin, tender, cracks badly, adherent to the pulp; flesh white, with colorless juice, meaty, crackling, sprightly, sweet; of very good quality; stone semi-clinging, ovate, plump, oblique, with smooth surfaces.

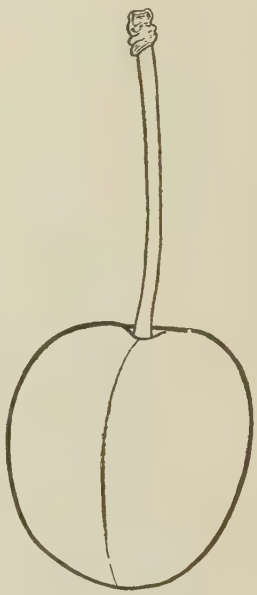
CHAPMAN. *P. avium.* Chapman is a sweet cherry, one of the "Hearts" of common parlance, its fruits distinguished and worth producing only because they are extra early, although when fully ripe they are of very good quality. The cherries run small, so that the variety requires good care and a choice cherry soil for a finely finished product. Tree and fruit are preëminently free from fungus diseases, but the robin and other birds take greater toll than from almost any other cherry, beginning their harvest long before the fruit is fit for human fare. Chapman might well be planted in a small way for a local market, but it has no place in large numbers in the East; it is more at home in California. Chapman came from a seed of Black Tartarian sown by W. H. Chapman, Napa, California, about 1890.

Tree large, vigorous, upright-spreading, dense, productive. Leaves numerous, 5½ inches long, 2½ inches wide, long-obovate, thin, slightly rugose; margin serrate, glandular; petiole nearly 2 inches long, slender, tinged with red, pubescent along the upper side and with a shallow groove, with from 2-4 large, reniform, reddish glands. Flowers early, 1 inch across. Fruit very early, season averaging 11 days; about ¾ inch in diameter, round-cordate, compressed; color purplish-black; stem thin, tender, separates from the pulp; flesh reddish, with dark juice, meaty, tender, mild, sweet; of very good quality; stone semi-clinging, oval, compressed, oblique, with smooth surfaces.

CLEVELAND. *P. avium.* Cleveland is a Bigarreau which falls so far short of its near kin as not to be worth planting except as an early cherry of its type, earliness being its one saving asset. The cherries closely resemble those of Rockport in size, color, shape, and flavor; they are in no way better, and are even more subject to brown-rot. The crop ripens with that of Black Tartarian, a sort with which it can never compete in orchard or market. Possibly Cleveland has too much merit to be wholly neglected, yet it is not worth planting, unless it be in a locality in which it does exceptionally well and in which an early cherry of its kind is wanted. Cleveland is said by its introducer, Professor J. P. Kirtland, Cleveland, Ohio, who brought it out in 1842, to be a seedling from Yellow Spanish.

Tree of medium size and vigor, upright-spreading, open, very productive. Leaves numerous, 5 inches long, 2½ inches wide, long-elliptical, thin; margin coarsely and doubly serrate, glandular; petiole often 2 inches long, red, slender, hairy, grooved, glandless or with 1-4 reniform, reddish glands on the stalk. Flowers white, 1¼ inches across; borne in scattered clusters, usually in twos. Fruit early; about ¾ inch in diameter, cordate, compressed, with an irregular surface; cavity wide, flaring, irregular; suture shallow, indistinct; apex obtusely-pointed; color light red overspreading yellow; dots numerous, small, yellowish, obscure; stem slender, 1½ inches long, adherent to the fruit; skin thin, tender, separating readily from the pulp; flesh light yellow, with colorless juice, tender and melting, sweet; good in quality; stone clinging, large, ½ inch long, oval, flattened at the base, plump, with smooth surfaces.

COE. Fig. 119. *P. avium. Coe's Transparent.* Coe, long known as Coe's Transparent, is the first of the light-colored cherries to ripen, and is an excellent fruit in quality and appearance. One defect is variability in color of fruit, the variant usually being very light-colored; and another, that the cherries run small. The tree-characters are in the main very good. The variety can be distinguished by the large, spreading tree; by hardiness, vigor, healthfulness, and fruitfulness. Coe is worthy of a place in every home plantation and in orchards for local markets. Curtis Coe, Middletown, Connecticut, grew this variety early in the nineteenth century from a pit of Ox Heart.



119. Coe. (×1)

Tree large, vigorous, upright-spreading, open, very productive. Leaves numerous, 4¼ inches long, 2¼ inches wide; margin coarsely serrate, with small, black glands; petiole 1¾ inches long, thick, tinged with red, grooved, hairy, with 2-3 large, reniform, greenish-yellow or reddish glands on the stalk. Flowers midseason, 1¼ inches across, white; borne in dense clusters, thickly distributed over the tree in twos and threes. Fruit early; 1 inch in diameter, round-cordate, slightly compressed; cavity regular, abrupt; suture indistinct; apex blunt-pointed or slightly depressed; color pale amber faintly mottled with red; dots small, light yellow, inconspicuous; stem slender, 1½ inches long, adherent to the pulp; flesh pale yellow, with colorless juice, tender, meaty, mild, sweet; good to very good in quality; stone semi-free or free, somewhat flattened, blunt, with smooth surfaces.

DIKEMAN. *P. avium.* Dikeman has some merit as a very late sweet cherry, but here its usefulness ends. The cherries are too small and the pits too large for the variety to have great worth. The tree is somewhat remarkable for its spreading habit and stout branches. Two very similar cherries, with a variation in the spelling, pass under this name. Late in the eighteenth century there appeared a cherry on the Dyckman farm near New York City. Some thought it to be identical with Black Tartarian; others said it was distinct and called it Dyckman. It was never more than of local

note. About 1890, the late S. D. Willard, Geneva, New York, introduced the Dikeman cherry from the farm of George B. Dikeman, Oceana County, Michigan.

Tree large, vigorous, broadly-spreading, open-topped, productive. Leaves numerous, 4½ inches long, 2¼ inches wide, folded upward, long-elliptical, thin; margin coarsely and doubly serrate; petiole about 1½ inches long, tinged with red, with a few hairs, with 1-4 reniform, reddish glands on the stalk. Flowers midseason, white, 1½ inches across; borne in scattering clusters, in ones, twos or threes. Fruit late; ¾ inch in diameter, cordate; cavity wide, flaring; suture shallow, indistinct; apex slightly pointed, with a small depression at the center; color purplish-black; dots numerous, small, dark russet, inconspicuous; stem slender, 1¼ inches long, adherent to the fruit; skin thin, tender, adherent to the pulp; flesh dark red, with dark-colored juice, very meaty, crisp, mild, aromatic, sweet; of good quality; stone clinging, longer than wide, ovate, flattened, with smooth surfaces, marked with a reddish tinge.

DOUBLE GLASS. *P. avium* × *P. Cerasus. Great Cornelian. Glass.* Double Glass is a Duke, a hybrid more nearly resembling the sweet than the sour cherry. The trees grow remarkably well in nursery and orchard, and their behavior so pleased growers when the variety was brought to notice that it became for a time quite the vogue. But the trees turned out to be unproductive and the cherries so mediocre that the variety rapidly passed through its heyday of popularity. The fruits are curiously marked, the suture being so deep as to make them appear double—hence the name. The variety has no value where sweet sorts are hardy, but might find a niche somewhere in regions where the more tender sweet cherry cannot be grown. This variety dates back in Germany to 1792.

Tree large, vigorous, upright-spreading becoming divergent with age, usually hardy, rather unproductive; leaves healthy, small to medium, ovate, with serrated margins. Fruit midseason; usually large, round-oblate, with a very deep suture; color light red becoming much darker at maturity; stem long, thick; skin thin, tough, translucent; flesh yellowish, with abundant uncolored juice, firm, tender, sprightly; good in quality; stone medium in size, round.

DOUBLE NATTE. *P. Cerasus. Riga.* Double Natte is a cherry of the Morello group hardly equal to English Morello except when earliness is a requisite, for this sort is one of the earliest of the Morellos. From the eulogistic reports of its behavior in the Middle West, it would seem that Double Natte is better adapted to the Mississippi Valley than elsewhere in this country. The variety was first mentioned by Knoop, the Dutch pomologist, in 1771. Some years ago J. L. Budd imported from Russia a cherry under the name Riga No. 18. This cherry has been grown under the name Riga, but the descriptions of Riga are identical with those of Double Natte.

Tree large, vigorous, upright-spreading, open-topped, somewhat vasiform, productive. Leaves numerous, 3½ inches long, 1¾ inches wide, short-obovate, thick, stiff; margin coarsely serrate, glandular; petiole thick, dull red, 1 inch long, glandless or with 1 or 2 small glands at the base of the blade. Flowers midseason, white, 1¼ inches across; borne in scattering clusters in twos and threes. Fruit early; ¾ inch in diameter, cordate to conical, compressed; cavity abrupt, regular; suture deep, distinct, often extending entirely around the fruit; apex depressed; color dark red; dots numerous, small, brown, obscure; skin tough, separating readily from the pulp; flesh dark red, with reddish juice, tender and melting, sprightly, sour; good to very good in quality; stone nearly free, longer than wide, nearly round, slightly flattened, with smooth surfaces.

DOWNER. *P. avium. Downer's Red Heart. Downer's Late.* Downer is one of the Hearts, much prized for its late, delicately and richly flavored fruits. Several defects keep it from being a variety of any considerable worth: the trees thrive only in the choicest soils; are often unhealthy and lacking in vigor; and the yield is small because the fruits are small. So, while the variety is desirable in a home orchard, as the crop ripens after almost all other dessert cherries have gone, Downer has small place in a commercial plantation. It should be said in its favor, as a commercial fruit, that the crop stands harvesting and shipping very well. Downer takes the name of Samuel Downer, Dorchester, Massachusetts, who grew it some time before 1832.

Tree large, vigorous, upright-spreading, dense-topped, productive. Leaves numerous, 3 inches long, 1¾ inches wide, obovate, rather stiff; margin doubly serrate, glandular; petiole 1 inch long, thick, dark red, glandless or with 1-3 large, globose or reniform glands on the stalk. Flowers midseason, white, 1¼ inches across; borne in thin clusters in ones and twos. Fruit the latest; ¾ inch in diameter, round-cordate, compressed; cavity shallow. flaring; suture obscure; apex pointed; color light to dark red frequently showing an amber background on the shaded side; dots numerous, small, russet; stem 1¾ inches long, adherent to the fruit; skin tough, separating from the pulp; flesh pale yellow, with colorless juice, stringy, tender, with soft flesh, mild and pleasant, sweet when fully ripe; good to very good in quality; stone large, free, ovate, flattened, with smooth surfaces.

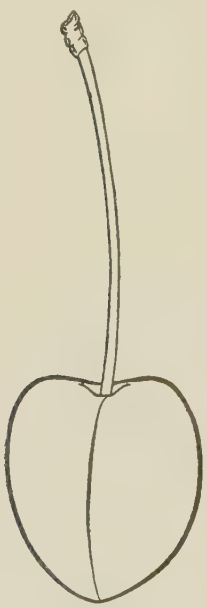
DYEHOUSE. *P. Cerasus.* Dyehouse is conspicuous among cherries for its early and beautiful fruit. Early Richmond is the standard early cherry, yet Dyehouse ripens its crop a week earlier, and the fruits are just as attractive in appearance and equally well-flavored. It is near of kin to Early Richmond, but the two may be distinguished by the difference in time of ripening and by the brighter, clearer color, greater opaqueness, more highly colored juice and slightly smaller size of the fruits of Dyehouse. Possibly this cherry would supersede the better-known Early Richmond were it not for the defect in size, and for the further faults of being less productive and more sensitive to environment, as it fails to thrive in localities where the older sort is quite at home. A Mr. Dyehouse, Lincoln County, Kentucky, raised the first tree of Dyehouse from a pit about 1860.

Tree small, vigorous, spreading, with drooping branchlets, dense, round-topped, productive. Leaves numerous, 3 inches long, 1½ inches wide; margin finely serrate, with small, dark glands; petiole ½ inch long, with 1-3 small, globose, greenish-yellow glands at the base of the blade. Flowers midseason, 1 inch across, white; borne in dense clusters, usually at the ends of spur-like branches in twos, threes or fours. Fruits early; ½ inch in diameter, oblate, compressed; cavity of medium depth, narrow, abrupt, regular; suture indistinct; apex flattened, with a small depression at the center; color dark red; dots numerous, small, obscure; stem 1 inch long, adhering well; skin thin, tough; flesh light

yellowish-white, with pinkish juice, tender, sprightly, tart; quality very good; stone free, ovate, flattened, with smooth surfaces.

EARLY MORELLO. *P. Cerasus.* About all that can be said in praise of Early Morello is that the trees are hardy, healthy, vigorous, fruitful, and regular in bearing. The cherries show the variety to be of the Amarelle group, but are such as to make it far inferior to Montmorency and other well-known Amarelles. The name is misleading, as the variety has little in common, in fruit or tree, with the true Morellos. Early Morello was introduced by Professor J. L. Budd from Orel, Russia, as Orel No. 23. The tree has proved very productive and hardy throughout the West. The cherries resemble those of Early Richmond, though smaller, a trifle darker, less acid, and appearing a week later. A dark-fleshed variety from Erfurt, Prussia, was sent out from Rosedale, Kansas, where it is known as Early Morello.

Tree of medium size and vigor, upright-spreading, very productive. Leaves 2¾ inches long, 1½ inches wide, thick, stiff, dark green, rather glossy, smooth; margin finely and doubly serrate, with small, dark glands; petiole glandless or with 1-3 small, globose, brown or yellowish glands. Flowers late, 1 inch across. Fruit midseason; about ¾ inch in diameter, oblate, compressed; color dark red; stem 1 inch long, adhering to the fruit; skin thin, tender, separating from the pulp; flesh light yellow, with pinkish juice, tender and melting, sprightly, tart; of very good quality; stone free, ovate, flattened, slightly pointed, with smooth surfaces, somewhat tinged with red.



120. Early Purple Guigne. (×1)

EARLY PURPLE GUIGNE. Fig. 120. *P. avium. Early Purple. Purple Guigne.* Early Purple Guigne is a valuable cherry on account of the earliness, attractiveness, and high quality of its fruits. The trees bear well and regularly after having become established in the orchard, but are poor growers in the nursery. More than most cherries, this one responds to good care and a choice cherry soil, a warm, free-working loam being best. A serious defect of the tree is that the fruit-spurs are easily broken during picking, and the crop of the next season thereby cut short. The cherries do not attain their rich purple color until full maturity is reached. No home collection should be without this variety, and it can often be profitably grown for the local market. Early Purple Guigne is the Early Purple of Ray in 1688. The variety was brought to America over a hundred years ago.

Tree large, vigorous, upright-spreading, open-topped, very productive. Leaves numerous, 4 inches long, 1¾ inches wide, obovate, thin; margin finely serrate, with small dark-colored glands on the stalk. Flowers early, white, 1¼ inches across; borne in scattering clusters, usually in twos. Fruit very early; 1 inch in diameter, cordate, slightly compressed; cavity regular; suture a faint line; apex pointed; color purplish-black; dots numerous, small, grayish, obscure; stem tinged with red, slender, 2 inches long, adhering to the fruit; skin thin, tender, separating readily from the pulp; flesh dark reddish-purple, with dark-colored juice, tender, melting, mild, sweet; of very good quality; stone free, large, broadly oval, compressed near the apex, with smooth surfaces.

EARLY RICHMOND. Fig. 121. *P. Cerasus. Virginia May. Early May. Kentish. French.* Early Richmond has long been the leading sour cherry of its season. It is not a remarkable variety in its fruit-characters, for the cherries are but medium in size, mediocre in quality, and not handsomer than those of other Amarelles with which it belongs. The fruits are very good for culinary purposes, and, when well ripened, may be eaten out of hand with relish by those who like the refreshing acidity of a sour cherry. They make a very good canned product, and before cherries were largely canned for the markets were much used in making dried cherries,—a delicious sweetmeat which kept for several months. The cherries are remarkable for the tenacity with which the stone clings to the stem. The tree thrives in varied soils and climates from the St. Lawrence to the Carolinas and from the Atlantic to the Pacific—everywhere vigorous, healthy, and fruitful. For the many purposes for which the fruit may be used, and because of the characters of the tree, Early Richmond is indispensable in every home and commercial orchard. This variety was early brought to America, where it became known as Early Richmond, as the first trees were grown at Richmond, Virginia. It was also grown as Virginia May, while in the West it has been called Early May. The French cherry, introduced into the lower St. Lawrence region, is very similar to Early Richmond. This strain, propagated from seed or sprouts, seems to be hardier than Early Richmond.

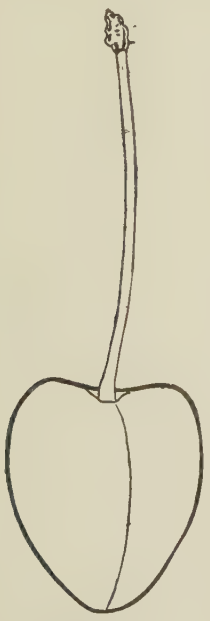
121. Early Richmond. (×1)

Tree of medium size, vigorous, upright-spreading, dense, round-topped. Leaves numerous, 3½ inches long, 1¾ inches wide, obovate, thick; margin finely and doubly serrate, glandular; petiole glandless or with 1 or 2 globose, greenish-yellow glands. Flowers midseason, 1¼ inches across, white; borne in scattering clusters, usually in twos and threes. Fruit early; ¾ inch in diameter, round-oblate, compressed; cavity abrupt, regular; suture indistinct; apex flattened; color dark red; dots numerous, small, russet; stem slender, 1 inch long, adherent to the fruit; skin thin, tough, separating from the pulp; flesh pale yellow, with light pink juice, stringy, tender and melting, sprightly; good to very good in quality; stone free, small, round-ovate, pointed, with smooth surfaces.

ELKHORN. *P. avium.* Elkhorn has served its day, and is now being rapidly superseded by other cherries of the Bigarreau group to which it belongs. It was valued by the old pomologists because of its large fruits, which have firm flesh, ripen late, are rich in flavor, and hang well on the tree long after maturity. But Elkhorn fails in bearing cherries quite variable in size, and in being but moderately productive. The bark of the trunk and main branches is so heavily overspread with gray as to make the color a distinguishing mark. The fruit is distinct in appearance by reason of the irregular surface of the skin. Elkhorn is an old English variety first mentioned in America by William Prince in 1832.

Tree large, very vigorous, upright, open-topped, moderately productive. Leaves numerous, 3¾ inches long, 2¼ inches wide, obovate, thin; margin coarsely serrate, glandular; petiole with 1-3 raised glands on the stalk. Fruit late midseason; ¾ inch in diameter, cordate to conical, compressed; cavity deep, wide, flaring; suture indistinct; apex rounded or pointed, with a slight depression at the center; color purplish-black; dots numerous, small, dark russet, inconspicuous; stem 1⅜ inches long, adhering to the fruit; skin thin, tender, adhering somewhat to the pulp; flesh characteristically dark purplish-red, with very dark-colored juice, meaty, firm, crisp, sweet; of good quality; stone semi-free, ovate, flattened, slightly pointed, with smooth surfaces, tinged with red.

ELTON. Fig. 122. *P. avium.* Elton is distinguished by the form, color, flesh, and flavor of its fruit. The cherries are oblong-heart-shaped, too much drawn out for best appearance, and often too oblique; the color is dark red, mottled with amber, very bright, clear, and glossy; the flesh, a little too soft to ship well, is delicate and most pleasing to the palate; the flavor is peculiarly rich and luscious, hardly surpassed by that of any other cherry. The trees may be as readily recognized as the fruit, by the unusually dark red color of the petioles of the leaves. The branches are stout and bear the crop thickly placed, close to the wood, and in prodigious quantities. Unfortunately the variety has a fault which makes it almost unfit for a commercial plantation. Brown-rot, the scourge of the sweet cherry, attacks this variety more aggressively than almost any other sort and for this reason, while its merits can hardly be too highly spoken of, Elton must remain a variety for the home orchard. The tree is a little tender to cold. This is another cherry from Thomas Andrew Knight, the great English pomologist, who fruited it first about 1806. It was brought to America in 1823.



122. Elton. (×1)

Tree large, vigorous, upright-spreading, open-topped, very productive. Leaves numerous, 5½ inches long, 2½ inches wide, long-obovate, thin; margin doubly serrate, with small dark glands; petiole 2 inches long, heavily tinged with red, with 2-4 reniform or globose, reddish-brown glands. Flowers midseason, 1½ inches across, white; borne in twos and threes. Fruit early; about 1 inch long, ¾ inch wide, cordate, conical, somewhat compressed and oblique; cavity abrupt, regular; suture indistinct; apex distinctly pointed; color dark red with an amber tinge, faintly mottled; dots numerous, small, light yellow, obscure; stem slender, 1¾ inches long; skin thin, tender, separating from the pulp; flesh white with a tinge of yellow, with colorless juice, slightly stringy, tender, very mild, sweet; of good quality; stone free, long-ovate, flattened, with smooth surfaces.

EMPRESS EUGENIE. Fig. 123. *P. avium* × *P. Cerasus. Eugenie.* This old French cherry, for many years largely advertised and widely sold in America, does not thrive in the New World. The two faults that condemn it here are that the cherries ripen very unevenly, making several pickings necessary, and the trees are so small that, though loaded with fruit, the total yield is not large. Lesser faults are that the cherries are not uniform in shape, and are borne thickly in closed clusters, so that when brown-rot is rife this variety suffers greatly. The short stem, too, prevents easy picking. In a home plantation, where the unevenness in ripening can be utilized to prolong the season, and where dwarfness may not be undesirable, Empress Eugenie may well find a place. This cherry appeared in 1845 as a chance seedling near Paris, France.

123. Empress Eugenie. (×1)

Tree small, not very vigorous, upright, becoming round-topped, very productive. Leaves numerous, 3½ inches long, 1¾ inches wide, obovate, thick; margin doubly serrate, with small, dark glands; petiole ¾ inch long, glandless or with 1 or 2 small, globose, greenish-yellow or reddish glands at the base of the blade. Flowers midseason, 1¼ inches across, white; borne in very dense clusters in threes and fours. Fruit midseason; ¾ inch in diameter, round-conic to oblate-conic, compressed; cavity narrow; suture very shallow, indistinct; apex flattened or depressed; color dark red; dots numerous, small, dark russet, obscure; stem 1¼ inches long, adherent to the fruit; skin tough, separating from the pulp; flesh pale red, with pink juice, tender, meaty, sprightly, pleasantly flavored, tart; of good quality; stone semi-clinging, small, ovate, flattened, oblique, with smooth surfaces.

ENGLISH MORELLO. Fig. 124. *P. Cerasus. Morris. Large Morello. Northern Griotte. Colorado Morello.* English Morello

is the standard late sour cherry in North America, occupying at the close of the season the place held by Montmorency in midseason. The fruits are not for the table, and can hardly be eaten out of hand until some of the astringency and acidity is destroyed by thorough ripening. In any way cherries are prepared by cooking, however, they are of the best, as culinary processes give the fruits a rich, dark wine color, very attractive in appearance, and a most pleasant, sprightly, aromatic flavor. The cherries are handsome in appearance, bear harvesting and shipping well, are resistant to brown-rot, and hang long on the trees after ripening. One may always know the trees once seen; they are small and round-headed, with branches that distinctly droop. To be sufficiently productive, an English Morello orchard must be closely set; for, although the trees are vigorous and productive for their size, they are too dwarf to yield heavily. The trees are hardy but not always healthy, and are not adapted to so great a diversity of soils as might be wished. The variety probably originated in Holland or Germany, whence it was introduced into England and later into America. Wragg is thought by some to be identical with this cherry, and if not, it differs but little; Northern Griotte, introduced by Budd from Russia, is English Morello; Morris, or Colorado Morello, put out by John Morris, Golden, Colorado, is also English Morello.

124. English Morello. (×1)

Tree small, upright-spreading, with drooping branchlets, dense-topped. Leaves numerous, 2¾ inches long, 1½ inches wide, obovate; margin faintly serrate, with small, dark glands; petiole ½ inch long, with small, globose or reniform, greenish-yellow glands. Flowers late, 1 inch across, white; borne in scattering clusters in twos and threes. Fruit very late; about ¾ inch in diameter, round-cordate, compressed; cavity shallow, narrow, flaring, regular; suture a shallow groove; apex rounded, with a small depression at the center; color dark red becoming almost black; dots numerous, small, dark russet, conspicuous; stem slender, 1 inch long, adhering well to the fruit; skin thin, tender, separating from the pulp; flesh dark red, with dark-colored juice, tender and melting, sprightly, tart; of good quality; stone free, small, ovate, flattened and pointed, with smooth surfaces, tinged with red.

FLORENCE. Fig. 125. *P. avium. Knevett's Late Bigarreau. Florence Heart.* Florence is a Bigarreau so similar to Yellow Spanish as to be hardly worth planting, since it is surpassed by its better-known rival. The fruit hangs on the tree in edible condition an almost phenomenal length of time, which fact has given rise to much divergence of opinion as to its season, some pomologists rating it as early, others as midseason, and still others as late. The trees are not so healthful, vigorous, or fruitful as those of Yellow Spanish, with which it must compete, nor are the cherries quite so fine in appearance or quality. This variety was found in Florence, Italy, early in the nineteenth century by John Houblon, who took it to England, whence it was brought to America.

Tree vigorous, upright, open-topped, productive. Leaves numerous, variable in size, averaging 4 inches long, 2 inches wide, obovate, thin; margin coarsely and doubly serrate, glandular; petiole 1¾ inches long, thick, pubescent, dull red, with 2-4 large, reniform, red glands. Flowers midseason, 1¼ inches across, white; borne in dense clusters in twos and threes. Fruit early; 1 inch in diameter, cordate, compressed; cavity deep, wide; suture very shallow; apex pointed; color reddish over an amber background, marked with indistinct, white spots and streaks; dots numerous, small, white, inconspicuous; stem 1½ inches long, adherent to the fruit; skin thin, separating from the pulp; flesh yellowish-white, with colorless juice, tender, meaty, crisp, sprightly, sweet; of very good quality; stone clinging, cordate, flattened, blunt, with rough surfaces.

125. Florence. (×1)

GEORGE GLASS. *P. Cerasus.* George Glass has been widely heralded as a desirable variety in the Middle West, but in the East, where it has passed through a rather lengthy probationary period, practically all who have tried it declare it worthless. It is of the Amarelle group, and cannot compete with the many good varieties of its kinship, as Early Richmond or the several Montmorencies. Its season is between Early Richmond and Montmorency. As compared with the last-named variety, the fruits of George Glass are smaller, sourer, less attractive in appearance, and the trees are far less fruitful, but possibly more hardy; this character commends it for the colder parts of the Mississippi Valley. The variety is supposed to have been introduced into Iowa by immigrants from northeastern Germany. It has been confused with Brusseler Braune and Bessarabian, and by some is thought to be identical with the latter.

Tree large and vigorous, upright-spreading, rather open, hardy, appears unproductive. Leaves numerous, 4 inches long, 2 inches wide, obovate, thick, stiff, dark green; petiole ¾ inch long, with 1 or 2 small, globose, reddish-orange glands. Flowers midseason, 1 inch across; borne in dense clusters. Fruit midseason; ¾ inch long, 1 inch wide, oblate, compressed; cavity deep; color light red changing to dark red; stem 1 inch long, adherent to the fruit; skin separating from the pulp; flesh yellowish-white, with abundant colorless juice, stringy, tender and melting, rather mild for a sour cherry; good to very good in quality; stone free, round or slightly oblate, plump, blunt, with smooth surfaces.

HOMER. *P. Cerasus.* Homer is a cherry of the Amarelle type from New England, which has little or no value in the East, but seems

to be very valuable in the northern states of the Great Plains because of hardiness. Nurserymen say that Homer is the hardiest of all European cherries in Minnesota and the Dakotas, and about the only cherry of its type that can be grown in those states. The variety was first described at the Iowa Experiment Station in 1903.

Tree rather small, somewhat spreading and drooping, very hardy, healthy and productive. Fruit early, ripening about with Early Richmond; medium to large; round oblate; stem short, stout; cavity shallow and of medium width; skin red becoming very dark red with maturity, thin, rather tough; flesh tender, uncolored, juicy, mild subacid; quality fair to good; pit round, semi-clinging, of medium size.

IDA. Fig. 126. *P. avium.* The fruit of Ida is large, light red, resembling that of Napoleon in shape and that of Rockport in color, but differing from both in having soft flesh, which places it among the Hearts rather than the Bigarreaus. Because of beauty of fruit, earliness, and good tree-characters, Ida promises to become a rather general favorite in home orchards, though it falls short in flavor and flesh-characters in the fruits. It can never take a high place among commercial kinds, because the cherries are too soft to handle well, show bruises plainly, are somewhat susceptible to brown-rot, and come when better cherries are plentiful. The trees are vigorous and hardy, and bear full crops regularly and in various environments. The variety is readily recognized by the upright habit of growth and by the large lenticels on the trunk and branches. Ida has been very well tried as a commercial variety, but in the ups and downs of the industry has not held its own with other sorts. E. H. Cocklin, Shepherdstown, Pennsylvania, grew this variety about 1870.

126. Ida. (×1)

Tree large, vigorous, upright, open-topped, vasiform, very productive. Leaves 5½ inches long, 2½ inches wide, obovate, thin; margin doubly crenate, with small, black glands; petiole 2¼ inches long, thick, usually with 2 large, reniform, reddish glands on the stalk. Flowers midseason, white, 1¼ inches across; borne in clusters, usually in twos. Fruit early; ¾ inch in diameter, cordate, slightly compressed; cavity deep, flaring, regular; suture a distinct line; apex variable in shape; color amber overspread with light red, mottled; dots numerous, large, yellowish, somewhat conspicuous; stem 1½ inches long; skin thin, separating readily from the pulp; flesh white, with colorless juice, tender and melting, mild, sweet; of good quality; stone free or semi-free, round, flattened, blunt, with smooth surfaces.

KING AMARELLE. *P. Cerasus. King's Cherry.* King Amarelle is an old European cherry which has taken on new life in America. It is of the Early Richmond type, differing in bearing fruit a little earlier, lighter in color, and with a longer stem. The fault which all but condemns the variety as a commercial cherry is the small size of the fruit, the cherries running smaller than those of Early Richmond. The tree is like that of Early Richmond—quite as vigorous and productive, of the same size and shape, and a little more hardy. The variety is recognized from afar in blossoming-time by the peculiar distribution of the flower-clusters, which are numerous and dense, but always separated by several inches of bare wood. King Amarelle can never displace Early Richmond, but might be tried where a hardier cherry is wanted. This variety, of old and uncertain origin, sprang up in France more than a century ago.

Tree of medium size and vigor, upright-spreading, open-topped, very productive. Leaves 3½ inches long, 1½ inches wide, obovate, glossy, thick; margin finely and doubly serrate, with small, dark glands; petiole 1 inch long, slender, with 1-3 small, globose, greenish-yellow glands. Flowers midseason, white, 1¼ inches across; borne in dense clusters, usually in threes. Fruit early; ¾ inch in diameter, round-oblate, compressed; cavity regular, abrupt; suture indistinct; apex roundish or flattened; color bright red; dots numerous, small, light russet, conspicuous; stem 1 inch long, adhering to the fruit; skin thin, tender, separating from the pulp; flesh pale yellow, with colorless juice, tender and melting, sprightly; fair to good in quality; stone free, ovate, flattened, pointed, with smooth surfaces, tinged with red.

KIRTLAND. *P. avium. Kirtland's Mary. Mary.* Kirtland stands among the best of the Bigarreaus in quality of fruit; in fact, the cherries are hardly surpassed in richness and delicacy of flavor. They are also handsome, resembling those of Napoleon, but are a little darker in color. The flesh is firm and meaty and stands handling well. With these excellent qualities of fruit, Kirtland would long ago have been one of the standard commercial cherries, were its tree-characters better. Wherever tried, the trees lack vigor, and can be grown only on choice cherry soils and under the best of care. With these faults the variety can be recommended only for home orchards and for local markets where there is demand for a very early Bigarreau, since this variety ripens before most other cherries of its kind. Kirtland was grown in 1842 by J. P. Kirtland, Cleveland, Ohio.

Tree small, rather weak, upright-spreading, open-topped, productive. Leaves 5 inches long, 2 inches wide, obovate, thin; margin doubly serrate with small, dark glands; petiole 1¾ inches long, slender, with 2 or 3 reniform, reddish glands. Flowers midseason, white, 1¼ inches across; borne in dense clusters. Fruit midseason; ¾ inch in diameter, cordate, compressed; cavity wide, flaring; suture a more or less distinct line; apex rounded or pointed, with a small depression at the center; color amber overspread with bright red; dots numerous, small, gray, conspicuous; stem 1¾ inches long, adhering to the fruit; skin tough; flesh white, with colorless juice, tender, meaty, with a pleasant and refreshing flavor; very good to best in quality; stone free, small, round-ovate, with smooth surfaces.

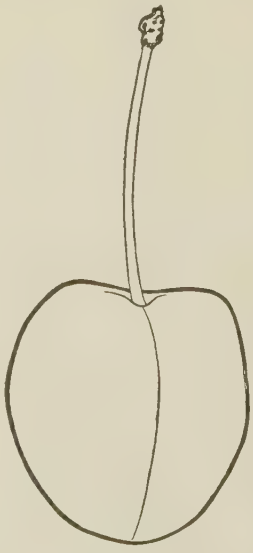
KNIGHT EARLY BLACK. Fig. 127. *P. avium.* Possibly Knight Early Black is to be

found in dooryards and home gardens in eastern United States as often as any other sweet cherry with the exception of Black Tartarian. The characters which give it popularity are chiefly those of its fruits, which are excellent in quality and handsome in appearance. The cherries are of a glossy, dark purple color, and are uniform in color, shape, and size. Unfortunately the fruits run small, leading to low yields. Knight, in size, color, and flavor of fruit is much like Black Tartarian, but the cherries are smaller and ripen earlier. The trees are about all that could be desired in a sweet cherry; these are characteristically marked by smooth bark dotted with large lenticels. This old variety has too many merits, especially for home grounds, to be wholly forgotten. Knight came from T. A. Knight, Downton Castle, Wiltshire, England, about 1810.

127. Knight Early Black. (×1)

Tree of medium size, upright-spreading, open-topped, very productive. Leaves numerous, 5½ inches long, 2½ inches wide, long-oval, thin; margin doubly serrate; petiole 2 inches long with 2 or 3 large, reniform, reddish glands. Flowers midseason, white, 1¼ inches across; borne in dense clusters, usually in twos. Fruit early; ¾ inch in diameter, conical; cavity wide, rather abrupt; suture indistinct; apex flattened, with a small depression at the center; color dark reddish-black, obscurely mottled; dots numerous, small, russet, obscure; stem slender, 1½ inches long, adhering well to the fruit; skin thin, tender, separating from the pulp; flesh dark red, with dark-colored juice, tender, meaty, mild, sweet; of good quality; stone free, small, round-ovate, with smooth surfaces.

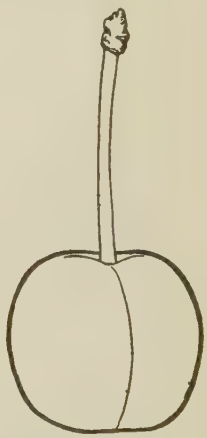
LAMBERT. Fig. 128. *P. avium.* In appearance, the fruits of Lambert are like those of Black Heart, having much the same shape and color, but larger, more rotund, smoother, and brighter. The flesh and flavor leave little to be desired; the flesh is purplish-red marbled with lighter red, firm, meaty, and juicy, with a sweet, rich flavor that at the first taste one marks "very good." The tree is strong, vigorous, healthy, and usually fruitful and regular in bearing. The fruit sets in great loose clusters, often a dozen or more cherries to the fruit-spur. The leaves are remarkably large, of dark green color, the foliage betokening the vigor of the variety. Lambert is well worthy of thorough testing for either home or market wherever the sweet cherry can be grown. It originated as a seedling under a Napoleon tree, about 1848, in the orchard of J. H. Lambert, Milwaukee, Oregon.



128. Lambert. (×1)

Tree medium to large in size and vigor, upright-spreading, very productive. Leaves 4¼ inches long, 2½ inches wide, obovate, thin; margin doubly serrate, glandular; petiole 1½ inches long, glandless, or with 1-3 small, globose, reddish glands. Flowers midseason, 1¼ inches across, white; borne usually in twos. Fruit midseason; 1 inch in diameter, round-cordate, compressed; cavity deep, flaring; suture shallow, often a mere line; apex rounded, depressed at the center; color very dark red changing to reddish-black; dots numerous, small, russet, obscure; stem tinged with red, slender, 1¼ inches long, adherent to the fruit; skin thin, adhering to the pulp; flesh dark red, with scant dark red juice, meaty, firm, pleasantly flavored, sweet; of very good quality; stone clinging, large, wide, ovate, flattened, blunt, oblique, with smooth surfaces.

LARGE MONTMORENCY. Fig. 129. *P. Cerasus. Flemish. Short Stem Montmorency. Montmorency.* Large Montmorency is easily distinguished by several marked characters from the common Montmorency, known to all, with which it is most often confused. Its fruits are more often borne singly, are larger, have a shorter, thicker stem, are more oblate, and ripen a little earlier. The trees are more upright, with stouter branches, and are far less fruitful. The flesh-characters of the two kinds are much the same; the flavor in both is particularly refreshing to those who like the acidity of the sour cherry. Large Montmorency has been tried and found wanting in productiveness, so that it can rarely be recommended as a commercial variety, but it is much too good a fruit to be wholly lost, and should be grown by connoisseurs who want a large, finely flavored sour cherry. Large Montmorency came to America from England about the same time as Montmorency and Early Richmond, early in the nineteenth century.



129. Large Montmorency. (×1)

Tree large, vigorous, upright, vasiform, unproductive. Leaves numerous, 3½ inches long, 1¾ inches wide, thick, stiff; margin serrate, glandular; petiole 1 inch long, glandless or with 1-3 globose, yellow glands. Flowers midseason, white, 1 inch across; borne in scattering clusters, usually in threes. Fruit midseason; ¾ inch in diameter, oblate, compressed; cavity wide, flaring;

suture shallow; apex flattened or depressed; color dark red; dots numerous, small, somewhat conspicuous; stem thick, 1 inch long, adhering to the fruit; skin thick, separating from the pulp; flesh white, showing distinctly the fibers in the pulp, with abundant colorless juice, tender and melting, sprightly, pleasantly flavored, tart; of very good quality; stone free, round, plump, with smooth surfaces, tinged with red.

LATE DUKE. Fig. 130. *P. avium* × *P. Cerasus.* Late Duke is a variant of the well-known May Duke, ripening from two weeks to a month later. The size, color, flavor, and season of the fruit all commend it, as do the vigor, health, and fruitfulness of the trees. The cherries are not quite so sweet as those of May Duke, a little more marbled in color of skin, and ripen through a longer season. The trees are readily distinguished from those of the earlier Duke, being more open and spreading, scanter of foliage, with more slender branches and fruit more thickly clustered along the branchlets. Ripening its crop in a season when hybrid varieties are gone or rapidly going, Late Duke is a valuable acquisition in the home orchard and for nearby markets to which tender-fleshed varieties can be sent. Planted on a northern slope, against a northern wall, or where it is in any way shaded, or in a cool soil, the delicious cherries from this variety can be had until August. The tree is hardy and its blossoming-time is late, so the variety is well adapted to northern latitudes. Late Duke has been cultivated in Europe for more than a century, and has been in America nearly that length of time.

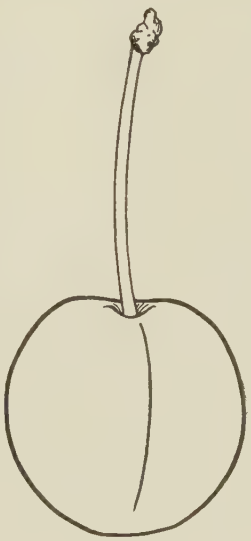
130. Late Duke. (×1)

Tree vigorous, upright-spreading, open-topped, productive. Leaves numerous, 3 inches long, 1¾ inches wide, obovate, thick; margin doubly crenate, with small, dark glands; petiole 1 inch long, glandless or with 1 or 2 small, reniform, greenish glands. Flowers late, white, 1 inch across; borne in numerous, dense clusters, in twos, threes and fours. Fruit very late; 1 inch in diameter, blunt-cordate, compressed; cavity wide; suture shallow; color dark red; stem slender, 1½ to 2 inches long, deeply inserted; flesh amber-colored, with abundant juice, tender, rich, sprightly subacid; stone semi-clinging, medium to large, round-ovate, compressed.

LATE KENTISH. *P. Cerasus. Kentish Red. Pie Cherry. Kentish.* This old cherry served well the needs of Americans in colonial times, when all cherries were grown from pits or suckers. Although but a little improvement on the wild cherry, the trees were so hardy, vigorous, healthy, and productive, that any one who had a bit of spare land could have cherries. This, therefore, became preëminently the "pie cherry" of New England and the North Atlantic states. The trees are long-lived, and even so late as a generation ago Downing says that this variety is "better known among us than any other acid cherry, especially abundant on the Hudson and near New York." The variety is never planted now, having long since been superseded by better sorts, but it is still to be found as old trees or self-sown near where a tree of the variety formerly stood. Late Kentish is a seedling sort belonging to America, having been planted along fences and roadsides in the earliest times. The following description is a compilation:

Tree small, bears annually, very productive, hardy. Fruit matures about 2 weeks after Early Richmond; medium or below in size, round, flattened; stem 1-2½ inches in length, stout, straight; color deep, lively red; flesh light colored, with abundant colorless juice, very tender, sour, remaining quite acid even when fully ripe; stone does not adhere to the stalk.

LOUIS PHILIPPE. Fig. 131. *P. avium* × *P. Cerasus.* If the descriptions of this variety and Olivet be compared, it will be found that the two cherries are nearly identical. They differ only in season of ripening and in minor tree-characters, this cherry having in the tree more the aspect of a Morello than has Olivet. The value of the two varieties to cherry-growers is the same and is indicated in the discussion of Olivet. Elliott, the American pomologist, imported Louis Philippe from France in 1846; but the cherry does not seem to have been known at that time in Europe, and it is possible that Elliott gave it its name.



131. Louis Philippe (×1)

Tree vigorous, upright-spreading, open-topped. Leaves numerous, 4½ inches long, 2⅛ inches wide, obovate, thick, leathery; margin finely serrate, with reddish-brown glands; petiole 1 inch long, with 1 or 2 large, globose, yellowish-red glands. Flowers 1¼ inches across, white, well distributed, mostly in threes. Fruit mid-season or later; 1 inch in diameter, round-ovate; cavity abrupt; suture very shallow to a mere line; apex flattened, depressed; color very dark red; dots numerous, unusually small, obscure; stem 1¼-1½ inches long, adhering to the fruit; flesh light red, with much wine-colored juice, fine-grained, tender and melting, sour at first, becoming pleasantly tart at full maturity; good in quality; stone separates readily from the flesh, small, round-ovate, plump.

LUTOVKA. *P. Cerasus. Galopin.* For a time Lutovka and Galopin were listed as two distinct varieties. Unquestionably they are the same, despite a seeming difference in

origin. Lutovka was introduced into this country by J. L. Budd, Ames, Iowa, in 1883, and, according to the introducer, was well known in Poland and Silesia as a roadside tree. As was the case with many of Budd's importations, this variety did not stand the test of culture. It is a shy bearer and is now seldom recommended.

Tree large, upright-spreading; leaves large, ovate, leathery, produced from short spurs along the main branches. Fruit midseason; medium in size, round-oblate; suture often a line, sometimes lacking; stem short, stout, set in a large, deep cavity; skin dark, clear red, thin, tough, translucent; flesh colorless, meaty, juicy, slightly acid; quality good; stone large, round, free.

LYONS. *P. avium. Early Lyons. Early Jaboulay.* Although commonly classed as a hard-fleshed Bigarreau, Lyons is really an intermediate between the firm-fleshed cherries and the soft-fleshed Hearts. The tree is a typical Bigarreau. The Heart-like cherries are extra early, large, handsome, and well flavored. The tree-characters are about all that could be desired. The blossoms of this variety are conspicuously large and showy, with pistils unusual in being longer than the stamens. Lyons is recommended for both home and commercial orchards. Lewis B. Eaton, Buffalo, New York, in importing cherry-trees from France in 1842, found among them one without a label, which turned out to be Lyons, an old French sort.

Tree vigorous, a rapid grower, upright-spreading. Leaves numerous, 5½ inches long, 2½ inches wide, long-elliptical, thin; margin coarsely serrate, with small, dark glands; petiole often 2 inches long, thick, glandless or with 1-6 large, reniform, reddish glands. Flowers midseason, large, often 1½ inches across, white; borne in dense clusters, in twos and threes. Fruit early; 1 inch in diameter, cordate, compressed; cavity flaring; suture shallow, or a mere line, often extending around the fruit; apex rounded or pointed; color very dark red; dots numerous, small, russet; stem thick, 1½ inches long; skin thin, tender, separating from the pulp; flesh reddish, with dark-colored juice, meaty, sprightly, sweet; of very good quality; stone semi-clinging, large, ovate, plump, with smooth surfaces.

MAGNIFIQUE. *P. avium* × *P. Cerasus. Belle Magnifique.* A generation ago, when American fruit-growing was in the hands of connoisseurs, Magnifique was more popular than now. It has failed as a commercial cherry because the crop ripens very unevenly, for there are sometimes green and fully ripe cherries on the tree at the same time. The cherries are very good in quality, although too acid to make a first-rate dessert fruit. The trees are vigorous and usually fruitful. Magnifique has been grown so long that its place in the orchard would seem to have been fixed; yet it might be made more than a cherry for the home, if commercial growers would plant it in a shaded place and a cool soil, and thereby retard ripening until other cherries are gone. This valuable cherry was brought to notice in 1795 by a nurseryman near Paris, France.

Tree large, vigorous, upright-spreading, dense, productive. Leaves numerous, 3½ inches wide, obovate, thick; margin finely serrate, with small, dark glands; petiole 1 inch long, glandless or with 1 or 2 small, reniform, greenish glands. Flowers late, white, 1 inch across, wide open; borne in dense clusters on short spurs, usually in threes or fours. Fruit very late; 1 inch in diameter, cordate; cavity deep; suture very shallow; color pale red changing to bright red; dots numerous, small, russet, conspicuous; stem 1¼ inches long; skin thick, tough, adherent to the pulp; flesh white, with abundant colorless juice, fine-grained, meaty but tender, pleasantly tart, sprightly; very good in quality; stone free, small, oval, plump, slightly pointed with smooth surfaces.

MAY DUKE. Fig. 132. *P. avium* × *P. Cerasus. Duke Cherry. May Cherry.* May Duke is one of the oldest, and, the world over, one of the most popular cherries. There are several reasons why it has attained and holds its popularity. The fruit is finely flavored, especially when prepared for the table, and even before ripe; it is also delicious to eat out of hand, if the cherries are dead ripe; and it may be left to hang for a month or six weeks, becoming daily sweeter and more aromatic. Despite tender flesh, the fruits ship well, although grown only for local markets, since the long period of ripening makes necessary several pickings—a fatal defect for a canning cherry or one for the general trade. The trees are as fruitful as any; are hardy, vigorous, and healthy; and few cherries thrive in greater variations of soil and climate. This fact accounts for the world-wide distribution of the variety in temperate regions. The fruit is well distributed in dense clusters on trees characteristically upright and vasiform, which bear a heavy canopy of dark-green luxuriant foliage. May Duke fills a particular place in the orchard as a fruit for the local market, and hundreds of newcomers have not been able to supplant it. May Duke is supposed to have originated in a district in France known as Médoc, and the name to have been derived from the place. In 1832, William Prince mentioned May Duke as being among the first of the cherries introduced to America from Europe.

132. May Duke. (×1)

Tree large, upright, vasiform, open-topped, very productive. Leaves numerous, 3½ inches long, 2 inches wide, obovate; margin finely serrate, with small, dark glands; petiole 1 inch long, slender, glandless or with 1 or 2 small, globose, brownish glands. Flowers midseason, white, 1¾ inches across; borne in dense clusters, in twos and threes. Fruit early; ¾ inch in diameter, cordate to conical, compressed; cavity abrupt, regular; suture indistinct; apex rounded with a small depression at the center; color light changing to dark red at full maturity; dots numerous, russet, obscure; stem slender, 1½ inches long, adhering strongly to the fruit; skin thin, tender, separating from the pulp; flesh dark red with pinkish juice, tender and melting, sprightly subacid, pleasantly flavored; of very good quality; stone nearly free, small, round, with smooth surfaces.

MERCER. *P. avium.* This comparatively new Bigarreau is on probation in many parts of the country, but the variety is all but worth-

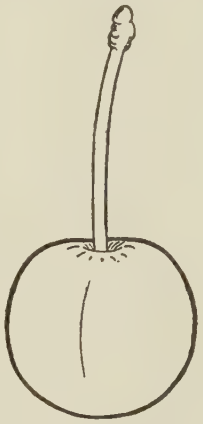
less as it grows on the grounds of the New York Experiment Station. The trees are not fruitful, the cherries are small, the flavor is none too good, and the fruit is not resistant to brown-rot,—four fatal defects for a commercial cherry. This variety is reported to have sprung from a pit of a Mazzard tree, and was introduced about 1890 by Black and Son, Hightstown, New Jersey.

Tree vigorous, healthy, unproductive. Leaves numerous, 4½ inches long, 2¼ inches wide, long-oval, leathery; margin coarsely and doubly serrate, glandular; petiole 1½ inches long, thick, with 2-5 very large, reniform, red glands. Flowers early; 1¼ inches across, in scattering clusters in twos and threes. Fruit midseason; small, cordate, compressed; cavity shallow, narrow, abrupt; suture an indistinct line; apex depressed; color black; dots small, numerous, obscure; stem slender, 1¼ inches long, adherent to the fruit; skin thin, tender; flesh red, with dark-colored juice, tender, meaty, crisp, aromatic, mild, sweet; fair to good in quality; stone free, ovate, flattened, blunt-pointed, with smooth surfaces, tinged with red.

MEZEL. *P. avium. Bigarreau de Mezel. Great Bigarreau.* Mezel seems to have made a stir in pomological circles in the nineteenth century by reason of the great size and beautiful appearance of the cherries. Although on the recommended list of the American Pomological Society, frequently spoken of in the pomological works of the day, and offered by some nurserymen, not many trees of this variety are now growing in the country. From the literature, it may be gleaned that the fruits pleased the eye more than the palate; and that the trees, while vigorous and healthy, were not productive. At any rate, after a decade or two of much advertising and what would seem to have been a very thorough trial, Mezel failed to receive approbation from cherry-growers, and has now almost passed from cultivation. This variety was found at Mezel, France, sometime prior to 1846, and was soon after imported to the United States.

Tree large, vigorous, upright-spreading, hardy, variable in productiveness. Leaves numerous, 5 inches long, often 2½ inches wide, long-oval, thin; margin glandular, coarsely serrate; petiole 1½ inches long, slender, with 1-4 reniform glands. Flowers midseason; 1½ inches across, well distributed in scattering clusters in twos and threes. Fruit midseason; large, 1 inch in diameter, cordate, compressed, the surface markedly irregular and broken into ridges; cavity very deep, wide, irregular, abrupt; suture variable, shallow to very deep and wide and at times double; apex blunt-pointed; color purplish-black; dots numerous, very small, russet, obscure; stem 2 inches long, adheres to the fruit; skin tender but not inclined to crack, adheres to the pulp; flesh purplish-red, with abundant dark red juice, tender, meaty, mild, very pleasant, sweet; very good to best in quality; stone clinging, large, strongly ovate, with rough surfaces.

MONTMORENCY. Fig. 133. *P. Cerasus. Long Stem Montmorency. Montmorency Ordinaire.* Montmorency is the most popular sour cherry grown in America. Several characters give it first place. It is surpassed by no other sour cherry in vigor, health, and productiveness of tree. Year in and year out, Montmorency trees are fruitful. No other sour cherry is adapted to a greater diversity of soils than Montmorency, which fact, with its capacity to stand heat and cold, makes the variety suitable to wide variations in environment. The fruit has the advantage of being presentable in appearance and fit for culinary purposes several days before it is fully ripe, and this adds to the value of the variety for market. Brown-rot takes less toll from this cherry than from others of its kind, probably because its fruits have relatively firm flesh and thick skins. The fruit stands handling well in harvesting, in shipping, and on the markets. The preserved product, whether canned at home or commercially, is attractive in appearance and very good. Montmorency is not a dessert cherry, but by those who like sour cherries the fruits when fully matured may be eaten out of hand with relish. The variety falls short in the size of the tree, which is seldom more than medium; but the head is spreading and much-branched, and the fruit is borne in clusters thickly scattered throughout the whole head, so that the total yield from a tree is greater than would be thought. For all purposes to which sour cherries are put, Montmorency may be recommended as the best in its season. The variety originated in Montmorency Valley, France, several centuries ago, at least before the seventeenth century. It has been cultivated in America under various names for at least a century.



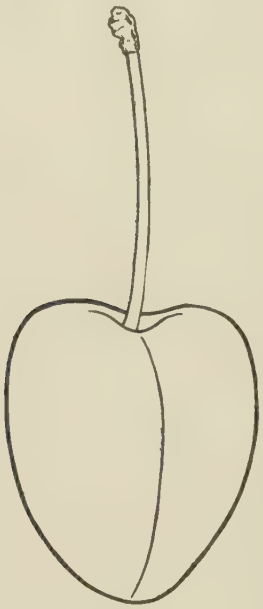
133. Montmorency. (×1)

Tree large, vigorous, upright-spreading, with the lower branches inclined to droop, round-topped, productive. Leaves 3 inches long, 1½ inches wide, obovate, leathery; margin doubly crenate, glandular; petiole 1 inch long, glandless or with 1-3 small, globose, brownish glands. Flowers midseason; white, 1¼ inches across; borne in scattered clusters in twos and threes. Fruit midseason; ¾ inch in diameter, round-oblate, slightly compressed; cavity abrupt; suture very shallow; apex rounded; color light to rather dark red; dots numerous, small, russet, inconspicuous; stem thick, usually with a faint tinge of red, 1 inch long, adhering well to the fruit; skin thin, tender, separating from the pulp; flesh pale yellow, with a reddish tinge, with abundant light pink juice, tender and melting, sprightly, tart; of very good quality; stone free, small, round-ovate, flattened, pointed, with smooth surfaces which are tinged with red.

MORELLO: See English Morello.

NAPOLEON. Fig. 134. *P. avium. Royal Ann.* Napoleon is the leading firm-fleshed sweet cherry. It takes its place by virtue of the large size, handsome appearance, and high quality of the fruit, and the phenomenal productiveness of the trees. The rich, sweet flavor with abundant juice and firm, crackling flesh, makes this a most delicious and refreshing cherry for dessert, and, with the great size and attractive color, give it preference over all other sweet cherries for canning and other culinary purposes. The cherries carry well

and keep long, and are, therefore, well thought of by fruit dealers. Besides being very productive, the trees come in bearing early, and are as vigorous, hardy, and healthy as those of any other sweet cherry. They may usually be known by their upright growth and large, sturdy limbs. Napoleon, however, is not without its faults. The cherries crack badly in wet weather, and the variety can be grown with certainty only in the dry climate of the Pacific coast, where it reaches truly wonderful perfection. In the East, Napoleon is more susceptible to brown-rot than several of its rivals. The tree is fastidious as to soils, thriving only in choice cherry land and in a congenial cherry climate. Despite these serious faults, Napoleon takes first place the country over among sweet cherries for both home and commercial plantings. Napoleon is of unknown origin. Early in the eighteenth century it was grown by Germans, French, Dutch, and English,—proof that it is a very old variety. It has been grown in America for at least a century.



134. Napoleon. (×1)

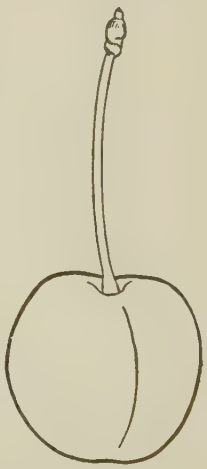
Napoleon has a great number of synonyms in several languages, showing the countries in which the variety has been grown and the esteem in which it has been held. Not content with the score or more of European names, cherry-growers in America have added two more. In many parts of the country it is commonly called Ox Heart. On the Pacific slope it is everywhere known as Royal Ann. The American Pomological Society placed Napoleon on its fruit-list in 1862. There are several accounts as to when the cherry was given the name Napoleon. Probably the best authenticated is that in which it is held that Parmentier, a Belgian, gave the cherry the name of the famous emperor in 1820. When the variety was taken to England, where at that time Napoleon was not in good repute, the name of his conqueror, Wellington, was substituted, but was little used.

Tree large, vigorous, upright-spreading, open-topped, very productive, shaggy. Leaves numerous, 5¾ inches long, 2½ inches wide; margin doubly serrate, with small, dark glands; petiole 1½ inches long, thick, with 2-3 large, reniform, reddish-orange glands. Flowers midseason, white, 1½ inches across; borne in scattering clusters in ones or in twos. Fruit midseason; over 1 inch in diameter, long-cordate, compressed; cavity deep, wide, flaring; suture a distinct line; apex much pointed; color, varying shades of bright red over a yellowish background, mottled; dots obscure; stem slender, more than 1 inch long, adherent to the fruit; skin thin, adherent; flesh white, with a faint yellow tinge, with colorless juice, tender, meaty, crisp, mild, sweet; good to very good in quality; stone semi-clinging, small, ovate, flattened, pointed, with smooth surfaces.

NOUVELLE ROYALE. *P. avium* × *P. Cerasus.* This cherry is one of the best of the Dukes. In particular, it is commended by its product, as the trees do not make so good a showing as the fruit. The cherries are distinguished by their large size, dark red color, glossy surface, good quality, lateness in maturing, and sweetness. The shape, also, offers a distinguishing character, the fruits being more oblate than those of any other Duke. The long, stout stem is still another characteristic. Unfortunately, the tree is unproductive. Nouvelle Royale is not widely known in America, and may well be given a trial by those who want a late Duke. This variety is supposed from its fruit- and tree-characters to be a hybrid between Early Richmond and May Duke, but where and when it came to light is not known. Downing, in 1869, mentions the Nouvelle Royale as having recently been introduced into this country.

Tree large, vigorous, upright, compact, moderately productive. Leaves numerous, 3½ inches long, 2 inches wide, obovate; margin finely and doubly serrate, glandular; petiole 1¼ inches long, slender, glandless or with 1-4 globose, greenish-yellow or reddish glands. Flowers midseason; white, 1 inch across; borne in dense clusters in threes and fours. Fruit midseason; 1 inch in diameter, oblate, strongly compressed; cavity deep, narrow, abrupt; suture shallow; apex flattened or slightly depressed; color dark red; dots numerous, small, russet, inconspicuous; stem 1¾ inches long, adherent to the fruit; skin tender, separating from the pulp; flesh pale yellow or with a tinge of red, with light pink juice, slightly stringy, tender and melting, pleasantly flavored, mildly tart; of very good quality; stone free, round-oval, plump, blunt, oblique, with smooth surfaces often tinged with red and small ridges radiating from the base.

OLIVET. Fig. 135. *P. avium* × *P. Cerasus.* Some writers call Olivet a Duke, while others place it with the Morellos. The fruit shows many characteristics of the Morellos, but the tree appears to be a Duke, so that it is probably a hybrid between trees of the two groups. The fruit is large, globular, deep red, glossy, with a rich, vinous, sub-acid flavor; eaten out of hand it would be rated as a very good Morello or a sub-acid and somewhat mediocre Duke, hardly good enough for dessert and not so good for culinary purposes as some of the sourer cherries. It is one of the earliest of the Mo-



135. Olivet. (×1)

rello-like cherries, and this advantage may give it a place in the cherry flora of the country. The trees are large and vigorous, and their much-branched, round tops would seem to give the maximum amount of bearing surface, but, unfortunately, the cherries do not set abundantly. Several distinct sorts pass under the name of Olivet in this country. Olivet was found at Olivet, Loire, France. Nurserymen introduced the variety into this country at some time previous to 1877.

Tree large, vigorous, upright-spreading, round-topped, unproductive. Leaves numerous, 3½ inches long, 1¾ inches wide, obovate, thin; margin doubly serrate, glandular; petiole 1¼ inches long, greenish, glandless or with 1 or 2 globose, brownish glands. Flowers midseason; white, 1 inch across; borne in dense clusters, usually in threes. Fruit midseason; 1 inch in diameter, round, slightly oblate, compressed; cavity abrupt, regular; suture a line; apex rounded, with a small depression at the center; color bright red; dots russet, obscure; stem thick, 1¼ inches long, adhering to the fruit; skin tough, separating from the pulp; flesh light red, with abundant light wine-colored juice, tender and melting, sprightly, astringent, tart; of fairly good quality; stone free, small, round, slightly flattened, somewhat pointed at the apex, with smooth surfaces.

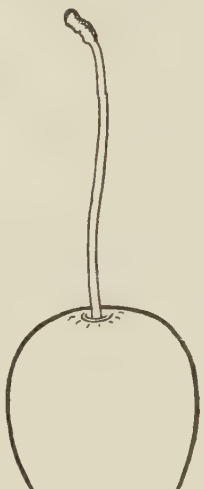
OSTHEIM. *P. Cerasus.* Ostheim finds favor in the prairie states, but is all but worthless in the eastern states. It is one of the Morellos, and falls far short of the best of its group, the cherries being small and of but mediocre quality. The trees are typical Morellos, round-headed, with slender, drooping branches and branchlets and very dark green foliage. The fruit is borne toward the ends of short branchlets, which are not well distributed over the main branches, leaving much bare wood. The fruit hangs long after maturity, and since the ripening season is late, the variety may be worth growing because of its lateness; as it may, also, in cold climates because of great hardiness. The trees on their own roots throw up many suckers which are often used in propagation. The variety has the reputation of coming true to name from seeds. Ostheim was found in the region of the Sierra Morena, Spain, and taken to Germany after the Wars of the Succession, 1701-1713. It takes its name from the German town where it was widely grown. Ostheim was brought to the United States early in the nineteenth century.

Tree below medium in size, vigorous, upright-spreading, with drooping branchlets, dense, very productive. Leaves very numerous, 3¼ inches long, 1½ inches wide, obovate to oval; margin finely serrate, with small, dark glands; petiole slender, ½ inch long, short, with 1-3 small, globose, greenish-yellow glands. Flowers midseason; 1 inch across, white; borne in scattering clusters, in twos and threes. Fruit very late; ¾ inch in diameter, round, slightly oblate, compressed; cavity very shallow and narrow, flaring; suture indistinct; apex rounded with a small depression at the center; color very dark red approaching black; dots numerous, small, dark russet, inconspicuous; stem slender, 1¼ inches long, slightly adherent to the fruit; skin thin, tender, separating readily from the pulp; flesh dark red, with much very dark-colored juice, tender and melting, sprightly, tart, losing its astringency when fully ripe; of fair quality; stone free, ½ inch in diameter, round-oblate, somewhat pointed, with smooth surfaces slightly stained with red.

OX HEART. *P. avium.* Ox Heart is a class name for the large, firm-fruited cherries which are cordate in shape. In America, the name is most often given to the light-colored cherries, such as Yellow Spanish and Napoleon. At one time, however, the name was applied to a distinct variety known throughout England, Germany, and America, being first mentioned by Miller, an Englishman, in 1734. Coxe, in 1817, was the first American writer to list the variety, but it never became popular in the New World. In the 1909 catalog of the American Pomological Society, there appears an Ox Heart of American origin and of recent introduction, known in the West as Major Francis. There is also in several nursery catalogs a "white-fleshed Ox Heart." The following is a description of the true Ox Heart:

Tree medium in vigor, round-topped, spherical, productive; branches somewhat curved. Leaves obovate, obtusely pointed; margin finely serrate; petiole short, rather slender, flexible, with 2 reniform glands. Flowers midseason, small. Fruit midseason; medium to large, cordate, pointed, sides unevenly compressed; color lively red changing to intense purple or nearly black; stem of medium length and thickness, inserted in a broad, deep cavity; skin tough; flesh dark red, with abundant colored juice, half-tender but firmer than most Hearts, sweet though slightly bitter before complete maturity; quality good; stone medium in size, broadly cordate, adhering to the flesh along the ventral suture.

REINE HORTENSE. Fig. 136. *P. avium* × *P. Cerasus. Hortense.* Reine Hortense takes high rank among hybrid cherries. To begin with, the fruit is excellent in quality, its flavor being a commingling of the refreshing acidity of the sour cherry and the richness of the sweet cherry. The cherries are also handsome, being large, round, bright glossy red with a shade of amber, and very uniform in size, color, and shape. The fruit is especially attractive on the tree, as it hangs on long stems in twos and threes thickly scattered and never much clustered. The chief faults of the variety are in the trees, which are of but medium size, not productive, and at their best only in choice cherry soils. In Europe, Reine Hortense is much used as a dwarf and for training on walls. The merits and faults of the variety are such as fit it preëminently well only for the amateur. M. Larose of Neuilly-sur-Seine, France, grew the original tree early in the nineteenth century. It was brought to America about 1850.

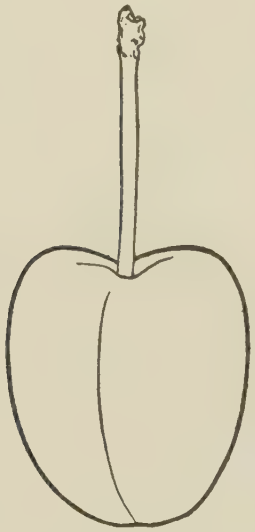


136. Reine Hortense. (×1)

Tree of medium size, upright-spreading, unproductive. Leaves numerous, 4½ inches long, 2½ inches wide,

obovate, thin; margin coarsely serrate, with dark glands; petiole 1 inch long, with 1-4 small, globose, brownish glands. Flowers midseason; white, 1¼ inches across; borne in dense clusters, usually in threes. Fruit midseason; 1 inch in diameter, oblong-conic, compressed; cavity shallow, narrow, abrupt, often lipped; suture indistinct; apex rounded with a small depression at the center; color amber-red; dots numerous, light russet, conspicuous; stem tortuous, slender, 1½ inches long, adherent to the fruit; skin tender, separating from the pulp; flesh pale yellow, with colorless juice, tender and melting, sprightly subacid; of very good quality; stone free, large, oval, flattened, blunt, with smooth surfaces.

REPUBLICAN. Fig. 137. *P. avium. Black Republican. Lewelling.* Judged by the palate, Republican is one of the best of the Bigarreaus. The cherries are rich in flavor, firm of flesh, and have an abundance of refreshing juice. Judged by the eye, also, the variety holds its own with the best of its class, the fruit having a pleasing rotundity of shape and a beautiful dark red, almost black, glossy color. In size of fruit, the variety often falls short. The trees are large, spreading, and vigorous, but are susceptible to the shot-hole fungus and exceedingly capricious as to soils, failing in all but the very choicest cherry environments. The cherry is, at most, of but local value. This variety originated about the middle of the nineteenth century in the orchard of Seth Lewelling, Milwaukee, Oregon.



137. Republican. (×1)

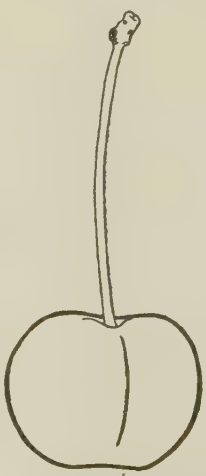
Tree large, vigorous, upright-spreading, open-topped, very productive. Leaves numerous, 5 inches long, 2⅝ inches wide, obovate, thin; margin coarsely and doubly serrate, glandular; petiole 1¼ inches long, thick, with 2 or 3 large, reniform, light green or reddish glands. Flowers midseason; white, 1½ inches across; borne in scattering clusters in ones and twos. Fruit late; 1 inch in diameter, wide, variable in shape, cordate or round-cordate, compressed, with angular and uneven surfaces; cavity deep, wide, flaring; suture a shallow groove, often extending around the fruit; apex with a small depression at the center; color purplish-black; dots numerous, small, dark russet, inconspicuous; stem thick, 1⅛ inches long, adherent to the fruit; skin thin; flesh purplish-red, with dark-colored juice, tender, meaty, crisp, mild, sweet or with slight astringency before fully mature; of good quality; stone semi-free, small, ovate, flattened, blunt, with smooth surfaces.

ROCKPORT. Fig. 138. *P. avium.* Rockport is more easily characterized by its faults than its merits. Compared with the well-known Yellow Spanish, of which it is a seedling and to which it is similar, the cherries are smaller and the pits are larger than those of the parent variety, the pits being much too large for the amount of pulp. The worst fault of the variety is, however, that the cherries are not sufficiently firm of flesh to withstand harvesting, shipping, and the attacks of the brown-rot fungus. To offset the defects of the fruit, the flesh is rich, sweet, and tender, making a cherry as good as any for dessert. The trees, also, are very satisfactory, being large, vigorous, and very fruitful, but have the reputation of requiring good soil and the best of care; they lack a little in hardiness. Rockport can be recommended only for a home orchard. This variety is another of Kirtland's introductions, having been raised by him at Cleveland, Ohio, about 1842.

138. Rockport. (×1)

Tree large, vigorous, very productive. Leaves numerous, 3½ inches long, 1¾ inches wide; margin coarsely serrate, glandular; petiole 2 inches long, glandless or with 1-4 large, reniform, reddish glands. Flowers midseason; white, 1¼ inches across; borne in clusters, usually in twos. Fruit early; 1 inch in diameter, cordate to conical, compressed; cavity shallow, wide, flaring, regular; suture a distinct line; apex roundish, with a small depression at the center; color bright red over an amber-yellow background, mottled; dots very numerous, small, light yellow, somewhat conspicuous; stem 1½ inches long, adhering to the fruit; skin thin, tender; flesh pale yellowish-white, with colorless juice, tender, melting, aromatic, mild, sweet; good to very good in quality; stone free, ovate, plump, with smooth surfaces.

ROYAL ANN: See Napoleon.



139. Royal Duke. (×1)

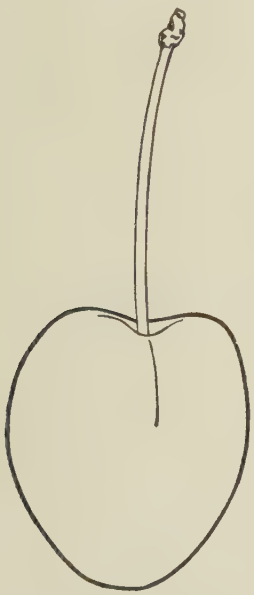
ROYAL DUKE. Fig. 139. *P. avium* × *P. Cerasus.* Royal Duke has a place in the cherry orchard to follow in season the well-known May Duke, and to precede Late Duke. It is so nearly like these two sorts, except in season, that there is much difficulty in getting the variety true to name. Royal Duke is often taken for May Duke, but it differs from this well-known sort in being a little later in season, while the cherries are larger, lighter in color, and do not hang so thickly, but are scattered along the branches, often singly,

PLATE VII.—BRADSHAW PLUM.

and are more oblate. The trees are markedly upright and the foliage is dense. The variety has a place in home orchards and for local markets. The origin of this variety is unknown, but it dates back at least a century and a half in Europe. According to Downing, it was brought to America in the first half of the nineteenth century.

Tree of medium size, vigorous, upright, vasiform, unproductive. Leaves numerous, 4½ inches long, 2 inches wide, obovate; margin serrate or crenate; petiole 1½ inches long, glandless or with 1 or 2 small, reniform, greenish-yellow or reddish glands. Flowers midseason; white, 1 inch across; borne in very dense clusters, closely grouped in fours and fives. Fruit early; ¾ inch in diameter, oblate, compressed; color bright red becoming darker at maturity; dots few, small, obscure; stem 1½ inches long, adhering to the fruit; skin thin, tough, separating from the pulp; flesh pale yellowish-white with tinge of red, pink juice, tender, sprightly, pleasantly acid; good to very good in quality; stone semi-free, small, ovate, slightly flattened, with smooth surfaces.

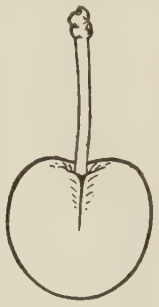
SCHMIDT. Fig. 140. *P. avium. Schmidt's Bigarreau.* Schmidt is not new nor little known, since it has been rather widely planted in America for many years. Yet it is not receiving the attention that it deserves from commercial cherry-growers, being relegated to the rear of a dozen kinds when it should be in the front rank. The characters which entitle it to a high place as a money-maker are: the fruits are large, being unsurpassed in size by any other black cherry; they are round and plump in form and glossy black in color; the flesh is dark ruby-red under the skin, which makes the cherry as pleasing inwardly as outwardly; and the cherries are free from brown-rot, in this respect excelling any other market sort. The trees are vigorous, healthy, productive, and characterized by abundant, large leaves of dark luxuriant green. The fruit is often picked before it is ripe, at which time it is dark red and not black. Schmidt originated with Herr Schmidt, Casekow, Prussia, about 1841. It eventually found its way to America, but when and how is not known.



140. Schmidt. (×1)

Tree large, vigorous, upright-spreading, open-topped, productive. Leaves numerous, 6 inches long, 3 inches wide, obovate; margin serrate, glandular; petiole 1½ inches long, thick, glandless or with 1 or 2 large, reniform, reddish glands. Flowers midseason; white, 1½ inches across; borne in scattering clusters in twos and threes. Fruit midseason; 1 inch in diameter, cordate, compressed, often slightly oblique; cavity deep, wide, flaring; suture indistinct; apex bluntly pointed; color purplish-black; dots numerous, small, dark russet, obscure; stem slender, 1½ inches long, strongly adherent to the fruit; skin tough, separating from the pulp; flesh purplish-red, with dark-colored juice, meaty, crisp, firm, mild, sweet; of good quality; stone semi-clinging, ovate, oblique, with smooth surfaces.

SHORT-STEM MONTMORENCY. Fig. 141. *P. Cerasus. Flemish.* Three distinct Montmorencies are cultivated. Of these closely related sorts, all of which originated at about the same time in Montmorency Valley, France, Montmorency is by far the most important and the only one now grown commercially in all parts of the country. Large Montmorency, quite similar to Montmorency, is much less grown because of its unproductiveness, although in quality it is superior. Short-stem Montmorency, now under discussion, varies considerably both in tree and in fruit from either of the other two, although it is frequently taken for Large Montmorency. The tree is smaller and more drooping, but usually more productive. The fruit, similar in size to that of Large Montmorency, differs from it by being more oblate and irregular; in having a very deep wide suture, which becomes an indistinct line towards the apex; in being seldom of so dark a red even at perfect maturity; the flavor is more sprightly; but the quality is not so high. The variety is little grown in North America, and is not so worthy for any purpose as either of the two better-known sorts.



141. Short-stem Montmorency. (×1)

Tree upright-spreading, round-topped, productive. Leaves numerous, 4 inches long, 1¾ inches wide, obovate, thick; apex taper-pointed, base acute; margin doubly crenate, glandular; petiole 1 inch long, glandless or with 1-3 large, raised, reniform glands. Flowers late; white, 1 inch across; borne in a few scattering clusters, variable in number of flowers per cluster. Fruit midseason; ¾ inch in diameter, decidedly oblate, irregular in outline, compressed; cavity deep, wide, irregular, flaring; suture very deep near the stem but shallow at the apex which is depressed; color light to dark red; dots numerous, small, russet, inconspicuous; stem very thick, less than ¾ inch long, adhering strongly to the fruit; skin tender and melting, sprightly, sour; of fair quality; stone clinging, small, round, plump, blunt, with smooth surfaces.

SKLANKA. *P. Cerasus.* Sklanka is evidently a cross between a cherry of the Amarelle group and one of the Morellos, the cherries having the light-colored skin and juice of the Amarelles, while the dwarfish, round-topped trees with pendant branches and abundant, small leaves are typical Morellos. The variety is in no way remarkable, unless it be in hardiness; the pomologists of the colder parts of the Mississippi Valley hold that it is one of the hardiest of cherries. The fruit is not on a par with that of a score of

other Amarelles, and the trees are too small and unproductive to be worth planting except where hardiness is a prime requisite. Sklanka was imported to this country from Russia in 1883 by J. L. Budd of Ames, Iowa.

Tree of medium size, vigorous, spreading, with drooping branchlets, open-topped, unproductive. Leaves 3¼ inches long, 1¾ inches wide, elliptical, thick, stiff; margin finely and doubly serrate, with small, dark glands; petiole ¾ inch long, thick, with 1-4 small, globose, orange-colored glands. Flowers midseason; 1 inch across, white; borne in dense clusters usually in threes. Fruit early; ¾ inch in diameter, oblate, not compressed; cavity narrow, abrupt; suture lacking; apex flattened or strongly depressed; color bright currant-red; dots numerous, light colored, conspicuous; stem 1 inch long, adherent to the fruit; skin tough, separating from the pulp; flesh pale yellow, with colorless juice, tender and melting, sour; of good quality; stone semi-free, clinging, about ⅓ inch in diameter, round, flattened, blunt, with smooth surfaces.

SPARHAWK. *P. avium. Sparhawk's Honey. Honey Heart.* Sparhawk has little to recommend it for either home or commercial orchard except the rich and honeyed sweetness of the cherries, which makes it worth planting by connoisseurs of good fruits. The name "honey," which appears in the synonyms, is indicative of the flavor of the fruit. The cherries are too small, and the pits altogether too large for a commercial product. The tree is upright-spreading, with numerous thick branches, over which the cherries are rather thickly scattered in ones, twos, and threes, but never in clusters. The fruit-stems are characteristically long and slender, although of the Bigarreau group, and the flesh is too tender to withstand harvesting, shipping, and the brown-rot. This cherry was introduced by Edward Sparhawk, Brighton, Massachusetts, about 1825.

Tree large, vigorous, upright, open-topped, hardy, unproductive. Leaves numerous, 5 inches long, 2¼ inches wide, long-oval, thin; margin coarsely and doubly serrate, glandular; petiole 2 inches long, with 1 or 2 large, reniform, reddish glands. Flowers midseason, 1 inch across. Fruit midseason; ¾ inch in diameter, conical, compressed; color dark red over a yellowish background, finely mottled; stem 1½ inches long, adherent to the fruit; skin thin, tough, separates from the pulp; flesh pale yellowish-white, with colorless juice, tender, crisp, highly flavored, mild, aromatic, sweet; very good in quality; stone nearly free, large, ovate, flattened, blunt, with smooth surfaces.

SPÄTE AMARELLE. *P. Cerasus. Späte Morello.* This is another variety with Amarelle fruit and a Morello-like tree—unquestionably a hybrid between varieties of the two groups. Several references from the Middle West mention Späte Amarelle as very promising, but where such sorts as Early Richmond and the Montmorencies thrive, it is unpromising for any purpose. The cherries are too poor in quality, and the trees too unproductive to make the variety even a poor rival of a score or more of Amarelles and Dukes with which it would have to compete. The origin of this cherry is unknown, but it was growing in Hanover, Germany, as Späte Morelle in 1785. In 1883 J. L. Budd, Ames, Iowa, brought the variety to America.

Tree of medium size, vigorous, upright-spreading, round-topped, unproductive. Leaves numerous, small, folded upward, oval to somewhat obovate, rather stiff; upper surface dark green, smooth; margin finely serrate, glandular; petiole greenish or with a slight bronze tinge, glandless or with 1-4 small, globose, yellowish glands. Flowers late; 1 inch across, white; borne in scattered clusters, usually in threes. Fruit midseason; ½ inch long, oblate, slightly compressed; cavity shallow, narrow; suture indistinct; apex rounded or depressed; color dark red; dots numerous, very small, obscure; stem slender, 1½ inches long; skin thin, tender; flesh light red, with light-colored juice, tender, tart; of good quality; stone free, round, flattened, with smooth surfaces.

SUDA. *P. Cerasus. Suda Hardy.* Suda has been widely advertised as an improved English Morello, but the new variety is not an improvement on the old. The trees of Suda in general aspect are more upright and not so productive; the stems of the cherries are longer and more slender than those of English Morello, being but an inch in length in the one variety and an inch and three-fourths in the other. The cherries are not so high in quality as those of the older and probably the parent variety. It is doubtful if there is a place for Suda in the cherry industry of the country. This cherry was originated in the garden of a Captain Suda, Louisiana, Missouri, about 1880.

Tree vigorous, rather unproductive. Leaves numerous, 4 inches long, 2¼ inches wide, obovate; margin doubly serrate, with dark glands; petiole 1 inch long, glandless or with 1 or 2 reniform, yellowish-brown glands. Flowers late, white, 1 inch across. Fruit very late; ¾ inch in diameter, round-cordate, slightly compressed; cavity flaring; suture indistinct; color dark purplish-red; stem slender, 1¾ inches long, adherent to the fruit; skin separating from the pulp; flesh dark red, with dark-colored juice, tender, meaty, sprightly, astringent, very sour; poor in quality; stone free or nearly so, pointed, with smooth surfaces.

TERRY. *P. Cerasus. Terry Early.* Fruit-growers in the Middle West believe that Terry is a most promising cherry for the prairies, as the trees stand the heat of the summer and the cold of the winter particularly well. The cherries are distinguished by the long stems, whereby the fruits may be readily picked without bruising. The history of the variety is not definitely known, but it is supposed that it was imported from Russia by H. A. Terry, Crescent, Iowa. The variety has been grown in Iowa for a quarter-century at least.

Tree upright, vigorous, very hardy and very productive. Fruit early; of medium size, round, flattened laterally; suture indistinct; stem long, slender; cavity shallow; skin tough, slightly astringent, deep red; flesh firm, subacid, colored; stone small, round; ripens at the New York Agricultural Experiment Station in June, as early or a little earlier than Early Richmond.

TIMME. *P. Cerasus.* Timme can hardly be distinguished from Early Richmond, differing only in its smaller fruits. The trees of Timme are more productive than those of Early Richmond, but the greater fruitfulness of the tree does not offset the smaller size of the cherries. It is doubtful if this new strain can displace the older Early Richmond, which is well established in the favor of cherry-growers everywhere. This variety is supposed to have been brought to America from Ger-

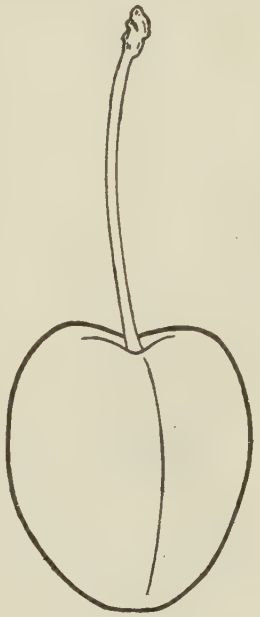
many by a Mr. Timme, Omaha, Nebraska, about 1900.

Tree medium in size, rather vigorous, upright-spreading, open-topped, healthy. Leaves 3½ inches long, 1½ inches wide, obovate, thick, stiff, leathery; margin finely serrate, tipped with reddish-brown glands; petiole ¾ inch in length, with 1 or 2 large, globose glands. Flowers 1 inch across, in dense clusters. Fruit early; over ½ inch in diameter, round-oblate; color light red becoming dark red at full maturity; stem 1 inch long; flesh yellowish-white, with abundant pinkish juice, tender and melting, pleasantly flavored; sprightly; good in quality; stone semi-clinging, round-ovate, plump, prominently ridged along the ventral suture.

VLADIMIR. *P. Cerasus.* Vladimir is a Morello-like cherry not more promising than any other of the many competitors of English Morello. The cherries are large, very similar in size and appearance to those of English Morello; the pit is small; the skin is very thin and separates readily from the pulp; the flesh is dark red with dark-colored juice, and too astringent and sour for dessert, but very good for culinary purposes. The tree is much like that of English Morello, but is more dwarf and not so productive, and ripens its fruit very unevenly. Vladimir has the reputation of being one of the hardiest of all cherries. It is said to come true from seed and to do better on its own roots than on either Mazzard or Mahaleb. The Russians succeed best with it when it is propagated from sprouts and allowed to form a bushy plant with several stems, the oldest of which are cut from time to time. Vladimir is a generic name for a group of varieties grown in Russia in the province of Vladimir, east of Moscow. J. L. Budd, Ames, Iowa, imported a number of these Vladimir cherries from central Russia about 1880.

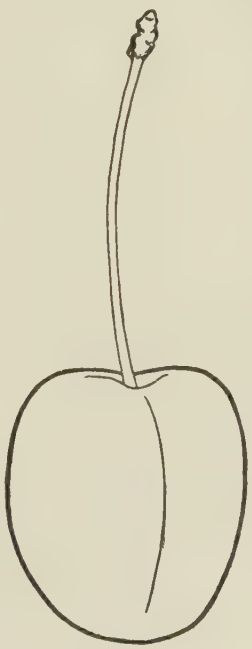
Tree dwarfish, round-topped, very hardy, productive. Leaves numerous, 3 inches long, 1¾ inches wide, oval, thick; margin finely serrate, with dark-colored glands; petiole ½ inch long, glandless or with 1-4 small, reniform, greenish-yellow glands. Flowers midseason, white, 1¼ inches across; borne in scattering clusters in twos, threes and fours. Fruit very late; ½ inch long, 1 inch wide, round-cordate, slightly compressed; cavity rather shallow; suture a line; apex rounded; color dark red almost black at full maturity; dots numerous, small, russet, inconspicuous; stem slender, 1½ inches in length, adherent to the fruit; skin thin, separating from the pulp; flesh dark red, with very dark-colored juice, stringy, melting, sprightly, astringent, sour; of fair quality; stone semi-clinging, large, long-ovate to oval, with smooth surfaces.

WINDSOR. Fig. 142. *P. avium.* Windsor is the standard late Bigarreau and one of the most profitable cherries grown in America. In color, the cherries meet the market demand, as buyers prefer a dark-colored sweet cherry. The fruits are firm and stand harvesting and shipping well; and, at a season of the year when brown-rot is usually rife, Windsor is fairly free from this scourge of the sweet cherry. The quality is good, equaled but not surpassed by others of its class. The trees have the reputation of being the hardiest of the Bigarreaus, of thriving in many soils, and of being fruitful. To offset these merits, the trees have three rather serious faults: they do not come in bearing early; they are tall and upright in growth, being almost fastigiate, so that it is difficult to harvest the crop; and the load of fruit is not well distributed. Cherry-growers agree that the worst of all pests for this fruit is the robin, and that Windsor is freest from this thieving bird. Windsor originated on the farm of James Dougall, Windsor, Ontario, and was introduced to fruit-growers in 1881.



142. Windsor. (×1)

Tree large, vigorous, upright-spreading, open-topped, very productive. Leaves 4 inches long, 2 inches wide, oval, thin; margin double crenate, glandular; petiole 1¼ inches long, with 1-3 globose, reddish glands. Flowers midseason, white, 1¼ inches across; borne in scattering clusters, in ones and twos. Fruit late midseason; 1 inch in diameter, oblong to conical, compressed; cavity deep, wide, flaring; suture a line; apex rounded, with a depression at the center; color very dark red becoming almost black; dots numerous, small, russet, obscure; stem slender, 1¼ inches long, adherent to the fruit; skin thin, adhering to the pulp; flesh light red, with reddish juice, tender, meaty, crisp, mild, sweet; good to very good in quality; stone semi-free, ovate, flattened, blunt-pointed, with smooth surfaces.



143. Wood. (×1)

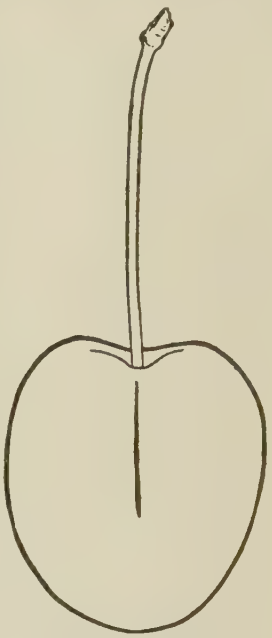
WOOD. Fig. 143. *P. avium. Governor Wood.* Wood is preëminently a sweet cherry for the amateur. The trees are tender to cold, are not quite productive enough to make the variety profitable, and are somewhat fastidious as to soils. To offset these defects, they are vigorous and healthy and bear early. But the chief fault of the cherry is to be found in the fruit. The flesh is soft and the cherries will not stand handling in harvest-

ing and shipping, and are very susceptible to brown-rot. It is one of the first of the sweet cherries—large, yellowish-white tinted with shades of crimson—a beautiful fruit. The flesh separates readily from the skin, is tender, juicy, with an abundance of colorless juice and a flavor that has given it the reputation of being one of the best in quality. It would be hard to name another cherry better suited for small plantations. Wood was raised by J. P. Kirtland in 1842 at Cleveland, and named in honor of Reuben Wood, Governor of Ohio.

Tree vigorous, upright-spreading, open, productive. Leaves numerous, 4½ inches long, 2½ inches wide, folded upward, obovate, thin; apex acute; base abrupt; margin coarsely and doubly serrate, glandular; petiole 1½ inches long, slender, with from one to three reniform, reddish glands. Flowers 1 inch across, arranged in twos and threes. Fruit matures in early midseason; 1 inch in diameter, roundish-cordate, compressed; cavity wide, flaring; suture distinct, wide; apex roundish; color crimson on a yellowish-white background; dots numerous, small, light russet, conspicuous; stem slender, 1½ inches long, adhering well to the fruit; skin thin, tender, separating from the pulp; flesh whitish, juice colorless, tender, mild, sweet; very good; stone clinging, large, roundish, blunt, with smooth surfaces; with a broad, ventral suture.

WRAGG. *P. Cerasus.* Wragg is either English Morello or a strain of that variety. In Iowa, where the new variety is most largely grown, pomologists claim that it is distinct and that it is an improvement on English Morello. The American Pomological Society calls English Morello and Wragg the same. Those who believe that the two are distinct say that the fruit of Wragg is larger, the trees hardier and that the cherries ripen a little later than those of English Morello. With the information now at hand, it is impossible to say whether or not Wragg is distinct. A compiled description taken from the texts describing this cherry is so unsatisfactory that we offer none, and refer the reader to that of English Morello, from which it differs but little, if at all.

YELLOW SPANISH. Fig. 144. *P. avium. Ox Heart. White Caroon. Spanish Bigarreau.* For centuries Yellow Spanish was the best of all the Bigarreaus, and it is only in comparatively recent years that it has had rivals. Even yet, in tree-characters it is hardly equaled, surpassing Windsor, which has a notable tree, in several respects, and falling short of it only in hardiness. The trees are the largest of all the varieties of sweet cherries, and have an upright-spreading top, which gives a large bearing surface and forms a canopy of excellent foliage; they are vigorous, bear abundantly and regularly, and come in bearing young, with the crop well distributed. Unfortunately, the cherries do not come up to the trees in points of superiority; they are smaller than those of Napoleon, the leading competitor of Yellow Spanish, and are more subject to attacks of brown-rot. In fruit, Yellow Spanish is rather the handsomer of the two cherries; the crimson color is more evenly distributed and the skin does not have the mottled appearance of the fruits of Napoleon; in quality, it is the better of the two, having tenderer flesh and a sweeter and richer flavor. Yellow Spanish is notable in the nursery for its strong, upright tree which bears large leaves, the leaves of no other variety attaining so great a size. Despite the great age of the variety, it still remains one of the best, furnishing proof that varieties do not degenerate with age. Yellow Spanish is so old and so widely disseminated that its origin can only be conjectured. From the name, one naturally infers a Spanish nativity, yet the variety is almost equally well known as Bigarreau, of French derivation. Under the latter name, pomologists believe that they trace its history to the first century of the Christian Era. The variety was imported to America from London by the Princes, Flushing, Long Island, in the year 1802, under the name Yellow Spanish.



144. Yellow Spanish. (×1)

Tree very large and vigorous, upright-spreading, open-topped, productive. Leaves numerous, 5½ inches long, 2½ inches wide, elliptical; margin coarsely and doubly serrate, with small, dark glands; petiole 1¾ inches long, with 1-4 large, reniform, reddish-yellow glands. Flowers midseason, white, 1¼ inches across; borne in well-distributed clusters, in twos and threes. Fruit midseason; 1 inch or over in diameter, cordate, compressed; cavity deep, wide, flaring; suture a mere line; apex rounded, not depressed; color bright amber-yellow with a reddish blush, slightly mottled; dots numerous, small, light russet, obscure; stem 1½ inches long, adherent to the fruit; skin thin, tough, separating from the pulp; flesh white, with colorless juice, tender, meaty, crisp, aromatic, sprightly, sweet; very good to best in quality; stone free, ovate, flattened, oblique, with smooth surfaces.

CHAPTER X

VARIETIES OF NECTARINES

The temptation is strong to include nectarines under peaches as a group not more distinct from any one of the several groups of peaches than these are from one another. In all pomological literature, current and past, however, the nectarine is discussed as a distinct fruit; it seems best, therefore, not to depart from a custom so well established. The nectarine is not an orchard fruit of importance in any part of North America excepting California, and in that state is of minor importance. The lack of culture of this fruit is due not to inferiority in the product, but to the fact that in the East curculio takes so great toll from the smooth-skinned nectarines that a crop can hardly be matured; while in the West, nectarines are not profitable because the fruits are too delicate to meet the demands of commerce, bruising and decaying before the crop can be put in the hands of consumers. For these reasons, there has been small demand for new varieties of nectarines; scarcely a score are under cultivation in the United States, of which sixteen are described in this chapter, the brief descriptions having been made, unless otherwise stated, from trees growing at Geneva, New York.

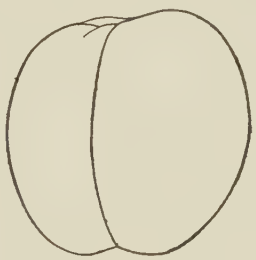
ADVANCE. Of the few early nectarines worth growing, Advance is much the earliest, ripening nearly two weeks before any other variety. The fruits are only medium in size, but are rich and well flavored, and the flesh separates freely from the stone. The variety is of little use in greenhouses, where nectarines are grown in the East, but is well liked by fruit-fanciers in California as an extra early variety. It is an old English sort, introduced into America a half century ago.

Tree large and vigorous, neither regular nor heavy in bearing. Leaves without glands. Flowers large and brilliant. Fruit extra early, of medium size, green on the shaded parts, with cheek blushed and sun-freckled with red and brown; flesh greenish-white, free from the stone, sweet and rich.

BOSTON. *Lewis. Perkin's Seedling.* Although Boston was being grown at least as early as 1830 in the United States, it is still a favorite in greenhouses and gardens in the East and as a commercial crop in California. The fruits are large and handsome, but, while they have a pleasant distinctive flavor, are not quite so acceptable for dessert as those of several other varieties. A peculiarity of the variety is that the stone is small and pointed. Boston was raised from a peach-stone planted by T. Lewis, Boston, Massachusetts, early in the last century, the first fruits being exhibited about 1830.

Tree small but vigorous, upright-spreading, hardy, productive; branches smooth, slender, dark red, with numerous conspicuous lenticels. Leaves rather large, lanceolate, thin, dark green, with globose glands. Flowers midseason, small, pink. Fruit late midseason, 1¾ inches in diameter, round-oval, irregular, halves unequal; cavity rather deep, wide; suture shallow or but a line; apex depressed, mucronate; color yellow blushed with crimson, sometimes mottled and sun-flecked; skin nearly free; flesh yellow, moderately coarse, sweet, aromatic, pleasant and distinctive; stone small, ovate, free, pointed, brown, corrugated; quality good.

CARDINAL. Fig. 145. This comparatively new nectarine seems to have been tested only in greenhouses in America. It is considered one of the best both here and abroad for forcing and for pot culture. The variety might well be tried as an extra early nectarine for



145. Cardinal. (×½)

out-of-doors, for, although it is a clingstone, its trim contour, delicately marked coloring, and piquant refreshing flavor make it a most inviting dessert fruit. Cardinal is an English nectarine first mentioned about 1890.

Tree rather small, round-headed, compact, hardy, productive. Leaves with reniform glands. Flowers large, pale rose. Fruit extra early, medium to small in size, oval; suture shallow but distinct; apex depressed with a well-marked abrupt tip; color greenish-yellow, marbled with a distinctive salmon-red, with white spots covered with net-like lines; flesh greenish-white, juicy, melting, piquant, refreshing; quality good; stone clinging rather tenaciously, somewhat large, ovate.

DOWNTON. For over a century one of the first-rate nectarines, Downton is still a staunch commercial variety wherever this fruit is widely grown, vigor of tree and great productiveness recommending it. It is a second early sort, ripening at Geneva, New York, early in September. The original plant was raised by the famous pomologist, T. A. Knight, of Downton Castle, Herefordshire, England, but the variety now grown in America is probably

the Improved Downton of Rivers, differing in having a better bearing tree and a more richly flavored fruit.

Tree of medium size, upright-spreading, hardy, very productive. Leaves large, lanceolate, thin, dark green, with kidney-shaped glands. Flowers midseason, 1 inch in diameter, pink, often in pairs, on short, glabrous, green pedicels. Fruit midseason, 2 inches in diameter, round-oval; cavity medium in width and depth; suture shallow; apex a sharp tip; color greenish-white, with a clean, lively red cheek next to the sun; flesh pale green, red at the stone, juicy, tender, fine-grained, sweet mingled with some piquancy, rich, aromatic; quality very good; stone free, ovate, medium in size, corrugated.

EARLY NEWINGTON. This old English nectarine was at one time very generally offered by American nurserymen, and an occasional tree of it is still to be found. The rich, sugary, vinous flavor commends the fruit, but the stone clings so tenaciously to the juicy flesh that the variety is not in favor with dainty eaters. It is an old sort, dating back a century or more, a seedling of Newington, from which it differs in its earlier fruits, which are larger, darker red, and richer in flavor; the parent is now discarded.

Tree large, spreading, hardy, productive. Leaves of medium size, lanceolate, thin, dark green, serrated, without glands. Flowers rather early, large, pink. Fruit early; large, 2 inches in diameter, round-ovate, irregular being enlarged on one side of the suture; cavity rather deep and wide; suture well marked; apex with a sharp, swollen point; color pale green with an over-color of lively red, marbled with darker red and usually covered with light bloom; flesh pale green, deeply stained with red at the stone, rich, sweet, juicy, aromatic; quality very good; stone of medium size, clinging rather tenaciously, ovate.

ELRUGE. Fig. 146. Mentioned first in 1670 and probably much older, Elruge is a time-honored landmark in the evolution of nectarines, and at the same time one of the best of its species. It is seldom to be found in the commercial plantations of California, but for over a hundred years has been an inhabitant of fruit-fanciers' collections on the

146. Elruge. (×½)

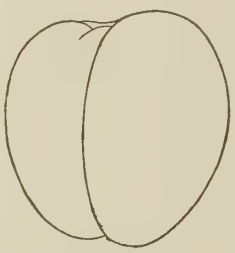
Atlantic seaboard, and is still offered by several eastern nurserymen. The fruit, while of but medium size, is voluptuously inviting in appearance, by reason of its trim contour, smooth flesh-colored skin, and crimson cheek, which, with its rich flavor, make it an alluring dessert fruit. Elruge, formerly spelled Elrouge, is said to have originated with a nurseryman in England named Gourle (Elrouge being an anagram of Gourle) in the time of Charles the Second.

Tree of medium size, compact, hardy, very productive, excellent for forcing under glass. Leaves rather large, thin, lanceolate, dark green, with reniform glands. Flowers midseason, small, ¾ inch in diameter, deep pink, solitary or in twos. Fruit midseason, 1¾ inches in diameter, round-oval, regular; cavity of medium width and depth; apex a swollen point; color creamy-white with a crimson cheek, sometimes sun-freckled with red; skin thin, adherent; flesh white, red at the pit, juicy, tender, piquant, aromatic; quality very good; stone free, small.

HARDWICKE. In southern California, Hardwicke is the favorite nectarine, being the heaviest and most dependable bearer. The fruits are said to make a most excellent dried product, as the cured nectarines have a rich flavor, and the flesh becomes almost translucent and of a beautiful amber tint. Eastern nurserymen do not offer the variety, and it is doubtful if trees can be found in the East. It is an old English nectarine, said to be a seedling of Elruge, introduced into the United States sometime previous to 1850.

Tree vigorous, hardy, spreading, productive. Leaves rather small, medium green, thin, without glands. Flowers large, more than an inch in diameter. Fruit midseason, very large, round or sometimes round-oval; color pale green almost covered with dark purplish red which becomes a solid color on the sunny side; flesh greenish, stained with red at the stone, tender, and melting, juicy, rich and sweet; quality good; stone of medium size, free, ovate.

HUMBOLT. Fig. 147. This is a comparatively new English nectarine, which, nevertheless, has been under cultivation for at least a

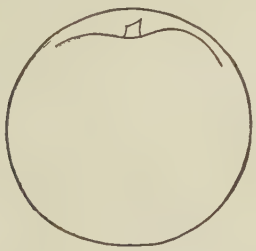


147. Humbolt. (×½)

half century,—so slowly do nectarines change. Pomologists in California speak of it as one of the best for some locations in that state. The large, deep-rose flowers are so beautiful that the variety is well worth cultivating as an ornamental. This variety is one of the many nectarines which originated with Rivers, the famous nurseryman, Sawbridgeworth, England.

Tree large, vigorous, hardy, usually productive, often bearing the second year out. Leaves long, thin, medium green, with round glands. Flowers very large, 1¾ inches in diameter, deep rose, solitary or in twos or threes. Fruit late, large, 2½ inches in diameter, oblong-oval; cavity rather shallow; apex a swollen point, slightly depressed; suture shallow or a hair-line; color yellow-orange, stained, streaked, mottled with dull red and sometimes sun-flecked on the cheek to the sun; flesh yellow, almost orange, tender, juicy, red at the pit, sweet, rich and aromatic; quality very good; stone free, obovate to ovate, pointed, corrugated, pitted, brown.

LORD NAPIER. Fig. 148. It is agreed, at home and abroad, that Lord Napier is the mainstay in commercial orchards as the earliest nectarine. The tree in California is reported to be a heavy and regular bearer, and the fruit



148. Lord Napier. (×½)

is pronounced about the best. The variety is grown as commonly as any other in eastern America either in the greenhouse or in the garden. This, too, came from Rivers, Sawbridgeworth, England, and is said to have sprung from a pit of the Early Albert peach.

Tree rather large, vigorous, as hardy as any, regular and productive in bearing. Leaves typical, with reniform glands. Flowers early, large, pale rose. Fruit early, large, 2½ inches in diameter, ovate, regular; cavity wide and rather deep; suture wide and shallow; apex depressed with a nipple in the depression; color pale cream, mottled and streaked with blood-red, with a dark crimson cheek on the side to the sun; flesh white, very tender, melting, juicy, without red at the stone, piquant; quality good; stone free, rather large, ovate, pointed, corrugated, slightly pitted.

NEWTON. Fig. 149. Out of more than fifty nectarines that have fruited at one time or another on the grounds of the New York Agricultural Station, Geneva, New York, Newton is about the best. The fruits are large,

149. Newton. (×½)

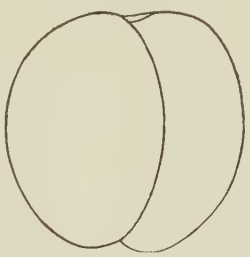
handsome, richly flavored, with flesh of almost jelly-like transparency. If they can be had free from the stings of curculio and the rot of monilia, both of which ravage the nectarine, the fruits are almost flawless—the consummate product of the peach family. Newton originated in England, where it is considered one of the best late nectarines, with Rivers of Sawbridgeworth, about the middle of the last century.

Tree large, vigorous, upright-spreading, open, hardy, productive; branches and branchlets reddish, short-jointed, with rather inconspicuous lenticels. Leaves large, 6 inches long, 1½ inches wide; margin serrate and glandular; petiole stout, with 3-4 reniform glands. Flowers small, ¾ inch in diameter, dark pink, solitary or in twos or threes. Fruit late, large, 2½ inches in diameter, oval; cavity medium in width and depth; suture shallow; apex depressed with an abrupt tip; color greenish-yellow, marbled with brownish-red and crimson with some pale spots; flesh pale green with faint red radiating from the stone, almost transparent, with a rich, almond-like flavor; quality very good; stone free, ovate, reddish.

NEW WHITE. *Large White.* According to Wickson, chief authority on fruits in California, New White is "commended wherever nectarines are grown in California, and is more freely planted than all other nectarines combined." It is not known in England or in eastern United States, at least under this name Its history is not given in California catalogs and fruit-books. Wickson describes it as follows in his *California Fruits:*

"Leaves with reniform glands; flowers large; fruit rather large, nearly round; skin white with occasionally a slight tinge of red; flesh white, tender, very juicy, with rich, vinous flavor; stone small and free."

PINEAPPLE. Fig. 150. Pineapple is probably fit only for forcing, and it is a favorite for that purpose in England, and is occasionally found under glass in America. English



150. Pineapple. (×½)

pomologists say that it is too tender for out-of-doors, and it seems not to have been tried in orchards in America. The variety has the charm of individuality in its very yellow flesh and its rich pineapple flavor. Pineapple seems to have been cultivated for a half-century at least. The description is compiled from English catalogs.

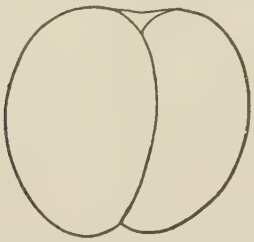
Tree rather small, tender, free in bearing. Leaves with round glands. Flowers large, deep rose with a dark eye, handsome. Fruit midseason, large, round-ovate; suture distinct; color deep orange with a bright crimson blush; flesh orange-yellow marbled with red next the stone, firm, aromatic, with a rich pineapple flavor; quality very good; stone free, small, with deep corrugations.

PITMASTON ORANGE. Sometimes offered as Pit Orange, Pitmaston Orange has been grown for nearly a century by fruit-fanciers, and is still esteemed for both the garden and the greenhouse. The fruit of no other nectarine excels that of Pitmaston Orange in beauty and quality. The trees are everywhere mentioned as excellent bearers, but have the reputation of being a little tender to cold. The variety came to America from

England, in which country it dates back to 1815 at least.

Tree rather small, tender to cold, very productive. Leaves with a tint of yellow, round glands. Flowers large, rich rose, borne very abundantly. Fruit mid-season, large, round-ovate; suture distinct; apex ending in an acute, swollen point; color rich orange, brownish-red next the sun, marbled with yellow; flesh deep yellow, red at the stone, juicy, very rich; quality very good; stone free, small, sharp-pointed, deeply furrowed.

RIVERS ORANGE. Fig. 151. After Pitmaston Orange, Rivers Orange is the favorite nectarine in America for forcing. The fruits



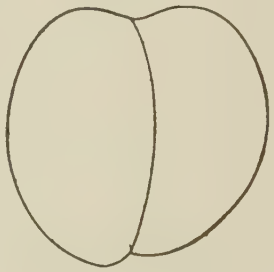
151. Rivers Orange. (×½)

of the two varieties are very similar, Rivers Orange being a seedling of Pitmaston Orange; the chief difference is in the trees, those of Rivers Orange being a little hardier, more robust, and more productive. The leaf-glands in Rivers Orange are reniform, while those of the parent are round. The variety is another of the remarkable nectarines which originated with Rivers, Sawbridgeworth, England, in the middle of the last century. In European countries, Rivers Orange is very generally taking the place of Pitmaston Orange, but in America the parent variety is preferred both in the orchard and in the greenhouse.

STANWICK. This is a variety of lesser importance, but much grown in England under glass, as it is somewhat in eastern America. It is offered by California nurserymen, but does not appear to be much grown in that state. In New York the trees are not hardy. The variety originated in England from seed brought from Syria and sown in 1843.

Tree medium in size, vigorous, compact, tender to cold, productive. Leaves with reniform glands. Flowers large, deep rose. Fruit late, large, round-oval, heart-shaped at the base; color pale green, purplish-red or almost violet in the sun; flesh white, melting, sweet, rich, aromatic, delicious; quality very good; stone rather large with a kernel similar in taste to that of the sweet almond.

VICTORIA. Fig. 152. This variety is occasionally to be found in America under glass, as it is one of the very best for forcing. The fruit is very similar to that of Stanwick, one of its parents, and all agree that it is as good, with the great merit of ripening a month earlier. In tree, it is nearly a duplicate of Stanwick. Grown under glass, this nectarine is one of the most luscious of all fruits—fare



152. Victoria. (×½)

fit to set before a king. The variety should be tried out-of-doors wherever nectarines succeed; for, on the grounds of the New York Agricultural Experiment Station, Geneva, New York, where nectarines do not thrive remarkably well, this one is about as satisfactory as any of the standard sorts, and the trees are much hardier than those of Stanwick. In England it has been grown since 1861, and is now a general favorite.

CHAPTER XI

VARIETIES OF PEACHES

In the author's *Peaches of New York*, 2181 varieties of this fruit are described; the number attests the variability of the peach in America, Europe, and Asia, many sorts grown at one time or another in the New World having come from the Old World. Of these, 120 are described in this text as being in cultivation at the present time, most of which, but not all, are offered in current catalogs of the trade. The great number of kinds can be distinguished through differences in size, shape, skin, flesh, flavor, aroma, stone, and season; and, if fruit be lacking or insufficient for identification, the leaf, flower, and tree offer nearly as many more distinguishing characters. If the histories be noted, it will be seen that most of the varieties have come from chance seedlings, and that there have been few attempts in the past systematically to breed peaches. The several groups and the many varieties described make an excellent foundation upon which to build, and now that plant-breeding centers around better-known phenomena than breeders have had to work with in the past, it may be expected that peaches superior to those we now have will be introduced rapidly. Unfortunately, a comparatively large number of the descriptions have had to be compiled; wherever this is the case, the fact is noted. All of the other descriptions, by far the larger number, have been made from trees growing on the grounds of the Experiment Station at Geneva, New York.

ADMIRAL DEWEY. Fig. 153. *Admiral. Dewey.* While nowhere largely planted, Admiral Dewey is often set for an early peach in commercial and home orchards. The

153. Admiral Dewey. (×½)

peaches are yellow in flesh, good in quality, not always freestone, run small, are so heavily pubescent as to be unattractive, are very susceptible to brown-rot, and are often disfigured by peach-scab. Admiral Dewey was grown from a seed of Alexander by J. D. Husted, Vineyard, Georgia, and was introduced in 1899; it is grown commercially East, West, North, and South.

Tree large, vigorous, upright-spreading, hardy, very productive. Leaves 6 inches long, 1½ inches wide, oval to lanceolate-obovate, thin; margin finely serrate; teeth tipped with reddish-brown glands; petiole ¼ inch long, with one to seven large, reniform, greenish-yellow glands. Flowers midseason, pink, 1½ inches across. Fruit early; 2¼ inches long, 2½ inches wide, round-oblate, compressed; cavity deep, wide, abrupt; suture shallow, deeper at the extremities; apex flattened, with mucronate tip; color deep orange-yellow, blushed with dark red, indistinctly splashed and mottled; pubescence heavy; skin thin, tender, adherent to the pulp; flesh yellow, tinged with red near the pit, juicy, stringy, tender, melting, sweet but sprightly; good in quality; stone semi-free to free, obovate, flattened at the base, tapering to a short point, with grooved surfaces.

ALBRIGHT CLING. Albright Cling is a great favorite among canners in the San Joaquin Valley, California. The fruits hang long on the trees and stand shipment well, even after ripening. The peaches ripen very late, enabling canners to make a late run in canning. The variety originated with a Mr. Albright, Placerville, California, at least a quarter-century ago.

Tree strong, bearing early, regularly and heavily. Fruit late, very large; yellow with a bright cheek; flesh firm, yellow, rather dry, rich and sweet; quality very good; pit of medium size, clinging.

ALEXANDER. *Alexander's Early.* Alexander is one of the notable early peaches on this continent, hardiness and vigor of tree contributing with earliness to make the variety popular. Unfortunately, the peaches run small, the flesh clings to the stone, is so tender that the two can be separated only with difficulty, and the quality is poor. In addition to the defects of the fruit, the trees have the fault of being unproductive. The fruits are very susceptible to brown-rot, but to offset this weakness, the trees are resistant to leaf-curl. Alexander has been more or less grown in every peach-region on this continent, sometimes attaining considerable commercial importance, but is now widely cultivated only on the Pacific slope. It is often confused with Amsden, though the two are quite distinct. Alexander originated soon after the Civil War on the farm of O. A. Alexander, Mount Pulaski, Illinois.

Tree large, vigorous, upright-spreading, hardy, unproductive. Leaves 6 inches long, 1½ inches wide, oval-lanceolate, thin, leathery; margin finely serrate; teeth tipped with dark-red glands; petiole ½ inch long, glandless or with 1-4 small, usually globose, greenish-yellow glands tipped with red. Flowers early, pale

pink, 1½ inches across. Fruit very early; 2¼ inches in diameter, round, compressed, with sides nearly equal; cavity deep, flaring; suture shallow; apex depressed, ending in a mucronate or small, mamelon, recurved tip; color greenish-white becoming creamy-white, blushed and blotched with dark red, mottled; pubescence short; skin separates readily from the pulp; flesh greenish-white, juicy, stringy, sweet, very mild; fair to good in quality; stone clinging, oval, plump, faintly winged, abruptly pointed at the apex, with slightly pitted surfaces and with a few grooves.

ALTON. *Minnie.* Alton is characterized by white-fleshed, semi-free peaches of large size and handsome appearance, borne on hardy and productive trees. The crop ripens a little earlier than that of Champion, long the favorite white-fleshed peach of its season, does not rot so readily when brown-rot is rife, and hangs longer on the tree in good condition. The fruits are not so choicely good in quality as those of Champion, nor are the trees quite so productive. Other faults are: leaf-curl takes heavy toll on unsprayed trees; the blossoms open so early as often to be caught by spring frosts; and the peaches show great variation in size, shape, texture, and flavor. Alton seems to be most at home in the Middle West and South. The variety originated with T. V. Munson, Denison, Texas, about 1890.

Tree vigorous, spreading, hardy, medium in productiveness. Leaves 6¼ inches long, 1¾ inches wide, oval-lanceolate, broad; margin finely serrate; teeth tipped with dark glands; petiole ½ inch long, with 2 reniform glands, greenish-yellow, tipped with dull red. Flowers early, pale pink, nearly 2 inches across; borne singly. Fruit early midseason; 2½ inches in diameter, round-oblate, compressed, with unequal halves; cavity flaring; suture of medium depth; apex roundish, mucronate; color creamy-white overspread with dull red, dotted and splashed with carmine; pubescence thin, short; skin tough, adhering slightly to the pulp; flesh white, juicy, stringy, tender, pleasantly subacid; fair in quality; stone semi-cling, plump at the apex, winged near the base, with pitted surfaces.

AMSDEN. Amsden was at one time a favorite early peach, but is now grown only in a few western states. The variety was added to the fruit list of the American Pomological Society in 1877, but was dropped in 1891. It grew from a seed planted in 1868 by L. C. Amsden, Carthage, Missouri.

Tree vigorous, productive; glands globose. Fruit very early, of medium size, round, slightly compressed; suture broad, shallow, extending beyond the depressed apex; skin greenish-white, nearly covered with light and dark red or purple in the sun; flesh greenish-white throughout, tender, juicy, sweet, vinous; quality good; stone small, nearly free when mature.

ANGEL. Angel is a peach of the Peento type which blooms nearly a month later than Peento in the southern states, thus escaping injury from frost in many sections. The variety is further distinguished by bearing young and in being very prolific. The fruit is also somewhat remarkable, entirely lacking the bitter-almond flavor of so many peaches of this group. Angel was grown from seed of Peento planted by P. C. Minnich, Waldo, Florida, about 1880.

Tree open, vigorous, bearing young, very productive. Fruit late, large, round or slightly pointed; suture shallow, short; apex slightly tipped; skin creamy-yellow tinted and washed with attractive red; flesh white, reddish near the pit, firm, juicy with a slightly acid and very agreeable flavor; quality very good; stone of medium size, free.

ARP. *Arp Beauty.* Arp is the earliest good yellow peach. The round-oval shape; shallow suture; creamy-yellow skin, heavily blushed with red; thick pubescence with the sheen of velvet make the peaches beautiful. The flesh is light yellow, firm, juicy, sweet, rich and of excellent quality; but, unfortunately, clings tenaciously to the stone. The season of Arp is from a month to five weeks earlier than that of Elberta, and for so early a peach is remarkably long. The trees are healthy, vigorous, productive, and hardier in bud than the average, but somewhat susceptible to brown-rot. The fruits stand the wear and tear of transportation and markets as well as those of any of the standard peaches. Arp originated with C. P. Orr, Arp, Texas, about 1897, and was introduced by the originator about 1902.

Tree large, vigorous, spreading, hardy, productive. Leaves 6¼ inches long, 1½ inches wide, oval-lanceolate, thin, leathery; margin finely serrate, tipped with reddish-brown glands; petiole ½ inch long, with 1-3 large, reniform, greenish-yellow or reddish-brown glands. Flowers midseason, light pink, 1¾ inches across; borne seldom in twos. Fruit early; 2 inches in diameter, round, compressed, the halves unequal; cavity medium to deep, wide, abrupt; suture shallow, deeper at the base; apex round or depressed, with a mucronate tip; color greenish-yellow changing to deep yellow, heavily blushed with red, indistinctly striped, with conspicuous dots; pubescence short, stiff, thick; skin thick, tough, adhering to the pulp; flesh light yellow with faint stripes of red radiating from the pit, juicy, stringy, tender, sweet, highly flavored; very good in quality; stone clinging, narrow-oval, plump, with short, acute apex, the surfaces pitted and with few short grooves.

BAILEY. Bailey is a very hardy variety grown in Iowa and Nebraska. The tree comes nearly true to seed, and the variety has been distributed in Iowa through seedlings, which accounts for the differences that appear in different localities. It was named after a Dr. Bailey, West Branch, Iowa, who grew the variety extensively. What its origin was does not appear, but it has been grown at least since 1893.

Tree dwarf, with spreading, willowy habit, very susceptible to mildew; leaves deeply serrated, glandless. Fruit midseason, rather small, pale yellow splashed with red on the sunny side; flesh white, juicy; quality fair to good; pit small, free.

BANNER. Though it was introduced at least forty years ago, it is still uncertain whether Banner is worth growing. At present, it is listed only by nurserymen in Michigan, New York, and Ohio, and the number of fruit-lists containing it grows fewer year by year. The variety fails because the trees are rather uncertain in bearing, and the peaches are small and only fair in quality. Banner originated in Essex County, Canada, about 1880.

Tree upright, spreading, hardy, vigorous but uncertain in bearing; glands usually reniform; flowers small. Fruit late, ripening a week after Elberta; round and slightly cordate; small or only medium in size; apex rounded with a mamelon tip; skin tough, with short, fine pubescence; deep yellow mottled with red; flesh yellow stained with red at the pit, moderately juicy, firm, mild; quality fair to good; stone broadly oval, slightly flattened, deeply grooved, free or nearly so.

BELLE. Fig. 154. *Belle of Georgia. Georgia.* Belle elicits praise because of the great beauty of its fruits, which are large, trim in contour, creamy-white, with a beautiful crimson cheek—truly voluptuous in form and color. The fruits are as enticing to the eye inwardly as outwardly, for the white flesh is delicately marbled, tinted with red at the pit, and flesh and pit usually part cleanly. Unfortunately, appearance misrepresents quality; for the variety, while good, falls short in flavor, and the flesh is stringy, so that it must be

154. Belle. (×½)

rated as not above the average for its type. The trees are large, open-headed, a little straggling, fast-growing, and hardy, though, like most of their type, easy prey to leaf-curl. Belle prefers a southern climate, and in the South is often a good commercial sort. Belle came from a seed of Chinese Cling planted in 1870 by L. A. Rumph, Marshallville, Georgia.

Tree large, vigorous, spreading, open-topped, hardy, very productive. Leaves 5½ inches long, 1½ inches wide, oblong-lanceolate, leathery; margin coarsely serrate; teeth tipped with dark red glands; petiole 1½ inches long, with 2-6 large, reniform or globose, greenish-yellow glands. Fruit midseason; 2 inches in diameter, round-oval, bulging near the apex, compressed, with halves nearly equal; cavity abruptly flaring, red, with tender skin; suture shallow, deepening toward the apex; apex round with a mucronate tip; color greenish-white changing to creamy-white, blushed with red, with faint stripes and splashes of darker red, mottled; pubescence short, fine, thick; skin thin, tender, adherent to the pulp; flesh white, tinged with red at the pit and with radiating rays of red, juicy, stringy, tender, sweet, mild; good in quality; stone semi-free to free, oval, bulged near the apex, blunt at the base, with short, sharp point at the apex, with deeply pitted surfaces.

BEQUETTE FREE. Bequette Free makes a favorable impression because of the flavor and attractive appearance of the fruit, but does not receive general commendation except on the Pacific slope. The trees are fast-growing, very vigorous, hardy, and densely clothed with foliage, but they cannot be called fruitful, and are susceptible to leaf-curl. This variety originated about 1860 in a seedling orchard of Benjamin Bequette, Visalia, California.

Tree large, vigorous, spreading, open-topped, hardy, rather unproductive. Leaves very numerous, 6¾ inches long, 1¾ inches wide, oval-lanceolate to broad-obovate, leathery; margin coarsely serrate; teeth tipped with dark glands; petiole ½ inch long, with 2-5 large, reniform, greenish-yellow glands. Flowers midseason, light to dark pink, 1¼ inches across, borne in ones and twos. Fruit midseason; 2½ inches in diameter, round-oval, compressed, often with unequal sides; cavity small, deep, abrupt, often tinged with red; suture shallow, deepening toward the apex; apex round, depressed at the center, with a small, recurved, mamelon tip; color greenish-white marked with yellow, blushed, splashed and blotched with dark red; pubescence thick, long, coarse; skin thin, tough, separates readily from the pulp; flesh white, tinged with red near the pit, juicy, stringy, tender and melting, pleasantly flavored, sprightly; good to very good in quality; stone nearly free, oval, with a short-pointed apex, with deeply pitted and slightly grooved surfaces.

BERENICE. At its best, Berenice is hardly surpassed by any other peach, but the fruits vary greatly, and this fact, with their none too attractive coloring, is probably the reason why the variety is not more grown. The trees are about all that could be desired, falling short chiefly in not being so productive as several other peaches of the same season and in being susceptible to leaf-curl. The variety has been offered to fruit-growers a sufficient length of time to have had its merits well tried as a commercial peach, and the fact that it is not now largely grown is presumptive evidence that it has little commercial value. The variety is a good sort for a home collection. Berenice originated some thirty or more years ago with the late L. E. Berckmans, Augusta, Georgia.

Tree large, vigorous, spreading, open-topped, hardy, medium to productive. Leaves 6 inches long, 1½ inches wide, oval to obovate-lanceolate, leathery; margin coarsely serrate; teeth tipped with dark glands; petiole ¼ inch long, with 2-10 large, reniform, yellowish-green glands. Flowers midseason, 1½ inches across, pale pink, tinged darker along the edges. Fruit midseason; 2½ inches in diameter, round-oval, with halves often unequal; cavity deep, medium to wide, contracted around the sides, with tender skin, often blushed with red; suture shallow, deepening toward the apex; apex roundish or depressed, with a mucronate or mamelon tip; color greenish-yellow, blushed and splashed with red; pubescence short, fine; skin tough, separates from the pulp; flesh yellow, faintly tinted with red near the pit, stringy, tender and melting, sweet, mild, pleasant flavored; good in quality; stone nearly free, oval, plump, drawn out at the ends, usually with pitted surfaces.

BILYEU. Discarded in the East, where it originated a half century ago, Bilyeu is now proving somewhat of a favorite in California as an extremely late freestone peach suitable for dessert and for local markets. The variety is one of the latest of all white-fleshed freestones, and is also remarkable for the exceptional vigor of the trees. Bilyeu originated as a chance seedling in Caroline County, Maryland, with a Mr. Bilyeu sometime previous to 1880.

Tree very vigorous, very productive, certain in bearing only in California. Fruit medium to large in the East, very large in California, round; skin greenish white with a red cheek; flesh white, firm, sweet, juicy; good to very good in quality; stone rather large, free.

BLOOD CLING. *Blood Peach. Indian Blood.* Blood Cling is the favorite curiosity of the peach-orchard. The fruit is pleasant to eat out of hand, and is much used for pickling and preserving, for which purpose it has much merit. This peach is an American seedling raised many years ago from the Blood Clingstone of the French. The fruit is much larger than that of the parent, but otherwise is much the same. The Blood Free raised by John M.

Ives, Salem, Massachusetts, while somewhat of the nature of Blood Cling, is, nevertheless, a different sort.

Tree large, vigorous, round, compact, hardy, unproductive. Leaves 5¾ inches long, 1½ inches wide, oval-lanceolate, leathery; margin finely serrate; teeth tipped with dark brown glands; petiole ½ inch long, with 2-5 reniform, light or dark green glands. Flowers midseason; blossoms pink, 1½ inches across. Fruit very late; 1¾ inches in diameter, compressed, with unequal halves; cavity narrow, abrupt, usually white; suture shallow; apex round, with a mucronate tip; color dull greenish-white, entirely overspread with dingy pink with splashes and stripes of darker, clouded red, mottled; pubescence long, coarse; skin tough, adherent to the pulp; flesh red, becoming lighter colored at the stone, juicy, stringy, tough and meaty, brisk, pleasantly flavored; fair in quality; stone clinging, obovate, short-pointed, strongly bulged near the apex, with grooved and pitted surfaces.

BLOOD LEAF. *Blood-leaved Peach.* Blood Leaf is a handsome ornamental. Its beet-red leaves in early spring and its pink blossoms, borne in great profusion, entitle it to esteem for both foliage and flowers. The peaches are in no way remarkable, and yet they please some as a dessert fruit. The variety originated in Mississippi in the sixties and was introduced in 1871.

Tree large, vigorous, upright-spreading, willowy in growth, open-topped, hardy, unproductive. Leaves 4¾ inches long, 1¼ inches wide, oval-lanceolate with tendency to obovate, thin; margin finely serrate; teeth tipped with small, dark glands; petiole ½ inch long, with 2-5 small, reniform, greenish-yellow, red-tipped glands. Blossoms midseason, 1½ inches across, pale pink. Fruit very late; small, round-oval, compressed, prominently bulged near the apex; cavity deep, narrow, abrupt, marked with narrow, radiating stripes of pale red; suture shallow, becoming deeper toward the apex; apex depressed, with a small, recurved, mamelon tip; color greenish-white and pale yellow, lightly washed with pink which changes to dull brown; pubescence thick, short, fine; skin thin, tender, sweet, with some astringency; poor in quality; stone clinging, long-oval, very plump, tapering to a short, blunt point at the apex, with grooved surfaces.

BOKHARA. Remarkable for great hardiness, Bokhara has little else to recommend it. The variety is grown only in the northern states of the great central plains, where, often, it is the only peach to withstand the cold climate. It was introduced by the late J. L. Budd from pits received from Bokhara, Russia, about 1890. It seems certain that there are several distinct peaches grown under this name, probably all from the pits planted by Professor Budd.

Tree large, spreading, very hardy; leaves numerous, thin, leathery; margins dark red and glandular, finely serrate; glands reniform. Flowers appear in midseason, medium in size, pink. Fruit midseason, of medium size, oblong-oval, bulging near the apex, making the halves unequal; suture shallow; apex with prolonged tip; skin thin, tender, with a thick, short pubescence, greenish-yellow, pale, faintly blushed and striped with dull red; flesh greenish-white, stringy, dry, sweet; quality poor; stone small, oval, nearly free, conspicuously winged.

BRACKETT. Brackett seems to have established a place for itself in parts of the South, but is still on trial in other peach-growing sections of the country. Its chief value is that the crop ripens just after that of Elberta when a yellow freestone peach is much needed. Brackett is said to be a cross between Smock and Chinese Cling, and was introduced by the P. J. Berckmans Company, Augusta, Georgia, in 1912.

Tree large, vigorous, productive, similar to that of Chinese Cling. Fruit late midseason, large to very large, oblong; suture shallow, ending in a sharp apex; color orange-yellow washed with red and mottled with deep carmine with a very dark carmine cheek; flesh deep yellow, juicy, large, sweet; quality good to very good; pit of medium size, free.

BRIGDON. *Garfield.* Brigdon belongs with the Crawfords, aristocrats among peaches, and this is enough to give it standing in a home collection at least. In tree and fruit it is similar to Early Crawford, is a worthy rival, and has the same two faults to bar it from commercial plantations—the trees are capricious as to soils and are often unproductive. On the other hand, a character of the tree to commend it to the amateur is that it is one of the least susceptible to leaf-curl. The variety is well known only in western New York. Brigdon originated about 1880 in Cayuga County, New York.

Tree large, vigorous, upright-spreading, open-topped, hardy, unproductive. Leaves 5⅞ inches long, 1½ inches wide, folded upward, oval to obovate-lanceolate, thin; margin finely serrate; teeth tipped with dark glands; petiole ½ inch long, glandless or with 1-4 small, globose, greenish-yellow glands. Blossoms midseason, pale pink, 1 inch across. Fruit midseason; 2½ inches in diameter, round-oval, compressed, bulged beak-like near the apex; cavity deep, medium to wide, abrupt or flaring, often colored with red; suture shallow; apex round with a pointed or recurved, mamelon tip; color greenish-yellow changing to pale orange-yellow, speckled and splashed with dull red which often extends over nearly the whole surface; pubescence long, thick, woolly; skin thin, somewhat tough, separates from the pulp only when fully ripe; flesh yellow, juicy, coarse, firm, tender, sweet, mild, pleasantly flavored; very good in quality; stone semi-free to free, oval, bulged on one side, with a rather long and slightly curved point, with pitted and grooved surfaces.

BRIGGS. *Briggs Red May.* Briggs is a standard early peach in California, ripening earliest of all market sorts in that state. The chief fault is in the trees, which lack vigor and are very subject to mildew. The variety seems not to be known in any of the peach regions east of the Pacific states. It originated about 1870 as a chance seedling on the farm of J. G. Briggs, Yuba City, California.

Tree vigorous, round-topped, somewhat spreading; foliage subject to mildew. Fruit very early; medium or rath small, round or round-oblong; skin white with a rich red cheek; flesh greenish-white, melting, juicy, sweet; quality fair to good; stone rather small, nearly free.

BURKE. The fruits of Burke are the largest and showiest of all clingstones as grown in the Gulf states, where the variety is at home, the peach having originated at Avoyelles, Louisiana, sometime previous to 1886. Burke is not worth growing in the North, as the fruits drop badly and lack both color and quality; the trees seem to be hardy, however, and the fruit usually ripens.

Tree vigorous, hardy, rather unproductive; leaves large, reniform glands; flowers appear midseason, large. Fruit midseason, large, oblong-oval, halves unequal, sides

drawn up about the cavity; apex with mucronate tip; skin thick, tough, covered with thick coarse pubescence, creamy-yellow with slight blush of lively red; flesh white, stained at the pit, firm, juicy and tender; quality fair to good; stone clinging, oval, pointed at the end, plump on one side.

CANADA. *Early Canada.* Since its introduction about 1890, Canada has been a standard early peach in the northern states and more particularly in the peach-growing region along Lake Ontario in Canada, where it originated. The variety has few characters to commend it, excepting earliness and hardiness, though the trees are often loaded with fruit. The peaches are small but attractive in color, which is bright red on a light background. The fruits are about the poorest of all peaches in flavor, but are firm and ship well for a white-fleshed peach, making a better commercial variety than its rival, Alexander; they are less susceptible to rot than those of Alexander, and the flesh does not cling so tightly. The variety originated as a chance seedling more than a quarter-century ago with A. H. High, Jordan, Ontario.

Tree large, upright-spreading, open-topped, hardy, productive. Leaves folded upward, 6 inches long, 1¼ inches wide, oval to obovate-lanceolate; margin finely serrate; teeth tipped with reddish-brown glands; petiole ¼ inch long, with from 1-4 small, globose, greenish-yellow glands. Blossoms midseason, dark pink at the center, bordered with lighter pink, 1½ inches across. Fruit very early; 2¼ inches in diameter, round-oblate, compressed, with unequal sides; cavity wide, flaring; suture shallow to deep; apex ending in a mucronate, recurved tip; color creamy-white, blushed with red and mottled and splashed with darker red; pubescence short, thick; skin thin, tender, separates from the pulp; flesh white, juicy, fine-grained, meaty but tender, sweet yet sprightly; fair in quality; stone semi-clinging, round-oval, plump, abruptly pointed, with small grooves in the surfaces.

CAPTAIN EDE. Fig. 155. *Ede.* Captain Ede has been under cultivation many years, but only recently has come into prominence, seeming now to find favor quite generally as a money-making peach. The trees are vigorous, heavy bearers; and the crop is uniform and always fair, smooth, without culls, ships well, and is in demand in the markets either for dessert or culinary purposes. The peaches are beautiful, and have a rich flavor, with a distinct smack of the almond. Captain Ede ripens with Early Crawford, a week or ten days before Elberta. The tree can hardly be distinguished from that of Elberta. The variety originated in 1870 as a seedling in the dooryard of Captain Henry Ede, Cobden, Illinois.

155. Captain Ede. (×½)

Tree large, vigorous, upright-spreading, hardy, not always productive. Leaves 5¾ inches long, 1½ inches wide, folded upward, oval to obovate-lanceolate; margin finely serrate; teeth tipped with dark red glands; petiole ¼ inch long, with 2-6 reniform, greenish-yellow glands. Blossoms very late, ¾ inch across, dark pink. Fruit midseason; about 2¼ inches in diameter, round-cordate, compressed, bulged near the apex; cavity wide, abrupt or flaring, often tinged with red and with tender skin; suture extending more than half-way around; apex round, with a prolonged, recurved, mamelon tip; color orange-yellow, with specks and splashes of red, blushed with darker red; pubescence thick, short, variable in coarseness; skin tough, adherent to the pulp; flesh yellow, stained red at the pit, dry, stringy, tender, meaty, strongly aromatic, pleasantly flavored; good in quality; stone free, oval, bulged along the ventral suture with pitted surfaces.

CARMAN. Fig. 156. Among many white-fleshed peaches, few hold a more conspicuous place than Carman. Its chief asset is a constitution which enables it to withstand trying climates, North and South, and to accommodate itself to a great variety of soils. While of but medium size, the peaches are most pleasing in appearance; the color is a brilliant red splashed with darker red on a creamy-white background; the shape is nearly round, and its trimness and symmetry make the peach, especially when packed in box or basket, one scarcely surpassed in attractiveness of form. The quality is rated as very good for a peach of its season, although a smack of bitterness in its mild, sweet flavor condemns it for some. The habit of growth is excellent; peaches are borne abundantly; brown-rot takes comparatively little toll; and in tree or bud the variety is remarkably hardy. Carman grew from a seed planted in 1889 by J. W. Stubenrauch, Mexia, Texas.

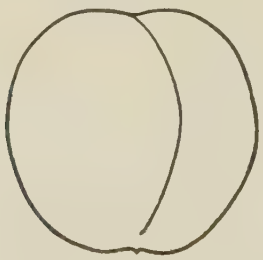
156. Carman. (×½)

Tree large, vigorous, upright, open-topped, hardy, very productive. Leaves 5⅞ inches long, 1¾ inches wide, oval to obovate-lanceolate; margin finely serrate; teeth tipped with dark red glands; petiole ¼ inch long, with 3-5 reniform glands. Blossoms midseason; flowers 1¼ inches across, pink; pedicels short, glabrous, pale green. Fruit early; 2¼ inches in diameter, round-oval, compressed, with unequal sides, bulged near the apex; cavity flaring, tinged with pink and with tender skin; suture shallow, becoming deeper at the cavity; apex round or depressed, with a somewhat pointed or mucronate tip; color creamy-white more or less overspread with light red, with splashes of darker red; pubescence very thick, short; skin thin, tough, adherent to the pulp; flesh white, red at the pit, juicy, tender, sweet, mild, pleasant; very good in quality; stone nearly free, plump, with thickly-pitted surfaces.

CHAIRS. *Chair's Choice.* Chairs is a select fruit in the Crawford group, in its turn the most select of the several groups of peaches. The variety was at one time a standard late, yellow-fleshed, freestone, market peach, competing in popularity with Late Crawford, over which it often held ascendency because less subject to brown-rot. The coming of the Elberta type has driven the Crawford group from the markets, and Chairs is now known only in collections where it will be long treasured for its delectable fruits. Unproductiveness and capriciousness in soil and climate, faults of all Crawford-like peaches, are marked in Chairs. The variety originated about 1880 in the orchard of Franklin Chairs, Anne Arundel County, Maryland.

Tree large, vigorous, upright-spreading, hardy, unproductive; trunk stocky. Leaves 5¾ inches long, 1½ inches wide, oval to obovate-lanceolate, thin; margin coarsely serrate, often in 2 series; teeth tipped with reddish-brown glands; petiole ¼ inch long, with 2-6 small, globose, greenish-yellow glands. Flowers late, dark pink fading toward the whitish centers, ¾ inch across. Fruit late midseason; 2¾ inches in diameter, round-oval, irregular, bulged beak-like along one side toward the apex, compressed, with unequal halves; cavity deep, wide, flaring; suture shallow, deepening toward the apex and extending slightly beyond; apex roundish, with a small, recurved, mamelon tip; color golden-yellow, blushed and splashed with dull red; pubescence short, fine; skin thin, tough, free; flesh yellow, faintly stained with red near the pit, juicy, stringy, tender, subacid or sprightly, pleasantly flavored; very good in quality; stone free, large, broadly oval, bulged along one side, plump, with surfaces deeply pitted and with short grooves.

CHAMPION. Fig. 157. Champion is rightly used as the standard to gauge the quality of all other white-fleshed peaches. The fruits are nearly as attractive to the eye as to the palate; but, unfortunately, run small and off-color in all but choicely good soils. The



157. Champion. (×½)

peaches are not only very good in the characters that make up quality—tender flesh, juiciness, pleasant flavor—but also have a peculiar honeyed flavor which gives individuality. The tree is almost perfect, few other varieties surpassing it in height and girth, and none equalling it in the quantity and the luxurious green of its foliage. A Champion tree is known by its foliage as far as the eye can distinguish color. As would be expected from the tree-characters given, Champion rejoices in vigor and health as do few other varieties. The variety surpasses most of its orchard-associates in productiveness, but the peaches are inviting prey to brown-rot; and the trees are sometime defoliated with leaf-curl; so that, with capriciousness as to soils, it has grave faults as a commercial variety. The original seed was planted about 1880 by I. G. Hubbard, Nokomis, Illinois, and the variety was introduced in 1890.

Tree large, vigorous, spreading, open-topped, very productive. Leaves 5¼ inches long, 1½ inches wide, oval to obovate-lanceolate; margin finely serrate; teeth tipped with dark red glands; petiole ½ inch long, with 2-5 small, globose, greenish-yellow glands. Blossoms midseason, pink, less than 1 inch across. Fruit midseason, 2¼ inches in diameter, round-oval, truncate, with halves usually equal; cavity shallow, narrow flaring, contracted; suture shallow; apex rounded, with a recurved tip; color pale creamy-white, with splashes of carmine mingled with a blush of darker red; pubescence short, thick; skin tough, adherent to the pulp; flesh white, red at the pit, very juicy, tender, sweet, pleasantly flavored; very good; stone semi-free to free, oval, long-pointed, with deeply grooved surfaces.

CHILI. *Hill's Chili.* Chili, long familiar to the older generation of peach-growers as Hill's Chili, is now waning in popularity, after having been for nearly a century one of the mainstays of commercial orchards the country over. The fruits were notable for culinary purposes, being especially desirable for canning and curing because of firm, dry, well-flavored flesh; and, besides, the crop ripened late in the season, when cool weather gave good storage conditions and made culinary work agreeable to housewives. The peaches are not attractive in size, color, or shape; are too dry of flesh to eat with pleasure out of hand; and are made less agreeable to sight and taste by pubescence so heavy as to be woolly. The trees of Chili are about all that could be desired; for, while of but medium size, they are vigorous, very hardy, long-lived, and annually fruitful. Chili came into cultivation early in the nineteenth century, when the first tree appeared in the orchard of Pitman Wilcox, Chili, New York.

Tree medium in size, compact, vigorous, upright-spreading, hardy, productive. Leaves folded upward and recurved, 6 inches long, 1½ inches wide, long-oval, thin; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 2-7 small, usually reniform, reddish-brown glands. Blossoms midseason, pink, 1½ inches across. Fruit late; 2½ inches in diameter, oblong-conic, angular, compressed, with unequal halves; cavity uneven, shallow, contracted, flaring, the skin tender and tearing easily; suture shallow, extending beyond the apex; apex pointed; color orange-yellow, with a dark red blush, splashed and mottled with red; pubescence long, thick, coarse; skin thin, tough, separates from the pulp; flesh red at the pit, yellow, dry, stringy, firm but tender, mild, sprightly; good; stone free, flattened at the base, obovate, winged, usually without bulge, long-pointed at the apex with pitted surfaces.

CHINESE CLING. *Chinese Peach. Shanghai.* Chinese Cling holds a high place in the esteem of American pomologists for its intrinsic value, because it was the first peach in one of the main stems of the peach-family to come to America, and because it is the parent of a great number of the best white-fleshed peaches grown in this country. The variety is not now remarkable for either fruit- or tree-characters, being surpassed in both by

many of its offspring, except, possibly in quality. The flavor is delicious, being finely balanced between sweetness and sourness, with sweet predominating, and with a most distinct, curious, and pleasant taste of the almond. The fruits are too tender for shipment and very subject to brown-rot. The trees are weak-growers, shy-bearers, tender to cold, and susceptible to leaf-curl. Chinese Cling was imported in 1850 by Charles Downing from Shanghai, China.

Tree weak in growth, upright-spreading, round-topped, not very hardy, medium in productiveness. Leaves 7½ inches long, 2 inches wide, broad oval-lanceolate, thick, leathery; margin coarsely crenate to finely serrate; teeth tipped with dark red glands; petiole ½ inch long, with 2-5 reniform, greenish-yellow, dark-tipped glands. Blossoms midseason, pink, 1½ inches across. Fruit late; 2½ inches in diameter, round-oval, compressed; cavity deep, contracted, narrow, abrupt, faintly tinged with red; suture deep, extending beyond the apex; apex round or flattened, with a mucronate tip; color greenish-white changing to creamy-white, blushed on one side with lively red, splashed and marbled with duller red; pubescence thick; skin tough, adhering to the pulp; flesh white, tinged with red near the pit, juicy, meaty, tender, sweet but sprightly, aromatic; good in quality; stone clinging, oval, conspicuously winged, bulged on one side, with pitted surfaces.

CHINESE FREE. Leaves, flowers, and fruits of Chinese Free are all smaller than those of Chinese Cling, the quality of the fruit is not nearly so good, while the tree runs a little better in most characters. The variety is surpassed by many other white-fleshed peaches of its season for both home and market. Chinese Free grew from a seed of Chinese Cling in the orchard of W. P. Robinson, Atlanta, Georgia, about 1880.

Tree vigorous, spreading, open-topped, neither very hardy nor very productive. Leaves 5¾ inches long, 1⅝ inches wide, oval-lanceolate; margin finely serrate; teeth tipped with dark red glands; petiole ½ inch long, with 2-6 large, reniform, greenish-yellow, dark-tipped glands. Flowers early, pale pink, darker along the edges, 1¼ inches across, often in twos. Fruit midseason, 2¾ inches in diameter, round-oval, bulged at one side, compressed, with unequal halves; cavity narrow, abrupt, tinged with red; suture shallow; apex rounded or pointed, with a mucronate tip; color greenish-white changing to creamy-white, blushed with red, mottled and striped with darker red; pubescence very short, thin; skin thin, tough; flesh greenish-white, stained with red at the pit, juicy, tender, melting, subacid, sprightly; good in quality; stone free, oval, plump, abruptly pointed, with pitted surfaces.

158. Climax. (×½)

CLIMAX. Fig. 158. Climax is a honey-sweet, freestone peach adapted only to the far South, where the fruits are large and attractive and the variety is a commercial sort. In the North, the peaches are small, unattractive in color, drop badly, are disfigured by peach-scab, and have only honeyed sweetness to recommend them. Climax is a seedling of Honey, but neither the date of origin nor the name of the originator is known. The variety was introduced by G. L. Taber, Glen Saint Mary, Florida, in 1886.

Tree small, vigorous, upright-spreading, round-topped, dense, productive. Leaves 6 inches long, 1½ inches wide, flattened, lanceolate, thin, leathery; margin bluntly serrate; teeth glandular; petiole ½ inch long, slender, glandless or with 1-4 small, reniform glands usually at the base of the leaf. Flowers late, pale pink, 1 inch across. Fruit midseason, 2⅜ inches in diameter, oval, slightly compressed, with unequal sides; cavity shallow, flaring, splashed with red; suture shallow; apex conic, with a long, swollen often recurved tip; color creamy-white, occasionally with a blush or faint mottlings of red toward the base; pubescence short, thick; skin thin, adherent to the pulp; flesh white, stained with red near the pit, juicy, stringy, melting, very sweet, mild; very good in quality; stone semi-free to free, oval, plump, bulged on one side, long-pointed at the apex, with pitted and grooved, reddish-brown surfaces.

CONNETT. *Connett Early.* This variety is a seedling of the old Chinese Cling, which it much resembles. At its best, the peaches are about the most delicately colored of all grown. They are remarkable also for their small stones, which cling little or not at all. The tree is hardy and vigorous in the North, but is a shy bearer, for which reason it is little grown. In parts of the South, it is a rather general favorite and perhaps would be listed as a commercial sort, if it did not ripen with the better known Carman. Connett originated with Rev. Alfred Connett, McLeansville, North Carolina, about 1880.

Tree very vigorous, large, round-topped, willowy in growth, productive in the South but a shy bearer in the North; leaves with reniform glands. Flowers midseason, large. Fruit early, ripening with Carman, medium or large, round-oval; suture shallow; skin thin, tough, creamy-yellow, slightly blushed with dark red; flesh white, stained with red at the pit, short, stringy, sweet, juicy; quality fair to good; stone free, small, oval, pointed at the ends.

159. Crosby. (×½)

CROSBY. Fig. 159. *Excelsior.* Of the several virtues which entitle Crosby to the esteem of fruit-growers, possibly the most notable is hardiness in tree and bud so marked that it is often called the "frost-proof" peach. Besides hardiness, the trees have to recommend them vigor, health, and productiveness.

The rich, yellow, freestone peach is delicious to the taste either as a dessert or as a culinary fruit. In these days of showy fruits, however, Crosby falls far short in appearance, as the peaches run small, are somewhat irregular, and are covered with dense tomentum. Still, at their best, in soils to which the tree is perfectly suited, the peaches are handsome. But there is another fault—the variety accommodates itself but poorly to trying soils and climates, failing especially in poor soils and dark climates. The tree is distinguished by its willowy growth, small leaves, small flowers, and, as has been said, by hardiness. Crosby was sent out about 1876 by a Mr. Crosby, Billerica, Massachusetts.

Tree small, vigorous, spreading, open-topped, unusually hardy, very productive. Leaves small and narrow, 5¾ inches long, 1¼ inches wide, obovate-lanceolate, thin; margin finely serrate or crenate; teeth tipped with dark brownish-red glands; petiole ½ inch long, with 2-7 rather small, reniform, greenish-yellow glands. Flowers midseason, pale pink, darker near the edges, 1 inch across. Fruit late; 2¾ inches in diameter, round-oblate, compressed, bulged near the apex, with unequal sides; cavity deep, flaring, sometimes splashed with red; suture shallow; apex rounded, with a sunken, mucronate tip; color orange-yellow, often blushed over much of the surface with dull red, splashed and striped with darker red; pubescence long, thick, coarse; skin thick, tough, adherent to the pulp; flesh deep yellow, stained with red near the pit, juicy, stringy, firm but tender, sweet, mild; very good in quality; stone free, oval, plump, bulged near the apex, with pitted and grooved surfaces.

EARLY CRAWFORD. Fig. 160. *Crawford's Early. Melocoton. Crawford's Early.* Unproductiveness and uncertainty in bearing keep Early Crawford from being the most

160. Early Crawford. (×½)

commonly grown early, yellow-fleshed peach in America. In its season the fruit is unapproachable in quality by that of any other variety. The peach has all of the characters that gratify the taste—richness of flavor, pleasant aroma, tender flesh, and abundant juice. In soils to which the variety is well adapted, the peach is large, often very large, round-oblong, slightly compressed; distinguished by its broad, deep cavity; color rich red, splashed and mottled with darker red in the sun, golden yellow in the shade. The flesh is marbled yellow, rayed with red at the pit, and perfectly free from the stone. The trees are all that could be desired in health, vigor, size, and shape, but are unproductive, uncertain and tardy in bearing. Early Crawford, for at least a half-century, was the leading market peach of its season, but gave way finally to white-fleshed sorts of the Belle, Carman, and Greensboro type. Though fast passing from commercial importance, the variety ought still to be grown in home plantations. Early Crawford came into existence in the orchard of William Crawford, Middletown, New Jersey, early in the nineteenth century.

Tree large, vigorous, upright-spreading, round-topped, unproductive. Leaves 6¾ inches long, 1½ inches wide, recurved, obovate-lanceolate, leathery; margin finely serrate, often in two series; teeth tipped with very small, reddish-brown glands; petiole ½ inch long, glandless or with 1-5 small, globose, greenish-yellow glands. Flowers midseason, pale pink, 1 inch across. Fruit early midseason, 2½ inches in diameter, round-oval, bulged near the apex, compressed, with unequal halves; cavity deep, wide, abrupt; suture shallow; apex often with a swollen, elongated tip; color golden-yellow, blushed with dark red, splashed and mottled with deeper red; pubescence thick; skin separates from the pulp; flesh deep yellow, rayed with red near the pit, juicy, tender, pleasantly sprightly, highly flavored; very good in quality; stone free, oval or ovate, bulged along one side, medium plump, with small, shallow pits in the surfaces.

EARLY ELBERTA. Several nurserymen have introduced strains of Elberta earlier or later than the typical variety. Most of these prove to differ not a whit from the standard Elberta. From the numerous introductions of this kind, it may be suspected that occasionally Elberta, because of some local condition, ripens its fruit prematurely or that ripening is sometimes delayed. When removed from the particular environment, ripening time seems to occur normally. Nevertheless, there is at least one early strain of Elberta distinct from the standard variety, differing but little from the parent except in season. The strain originated with Dr. Sumner Gleason, Kaysville, Utah, and was introduced by Stark Brothers, Louisiana, Missouri, about 1908. The variety seems to have found a place in the peach sections of the Rocky Mountains and in the Southwest, but as yet is little grown in the East. It ripens ten days to two weeks earlier than Elberta. The peaches differ from those of the true Elberta in other qualities than earliness, in being rounder, with more of an overblush of red, a little freer from fuzz, and, according to most growers, a little better in quality,—at any rate being sweeter. Unfortunately, trees of Elberta have rather frequently been substituted for those of Early Elberta.

EARLY WHEELER. *Wheeler Cling.* Early Wheeler is rated by some peach-growers as one of the most profitable peaches grown in Texas and other southern states. The peaches are very showy and attract attention on the market, and, while not of the best quality, are very good. The variety seems not to have been tried in the North except at one or two of the experiment stations, where the trees are reported as shy bearers. Early Wheeler is one of the large number of Heath Cling seedlings grown by E. W. Kirkpatrick, McKinney, Texas, about 1900.

Tree large, upright-spreading, hardy, healthy, productive in the South but only moderately so in the North; glands reniform. Flowers very large, tinted with pink, midseason. Fruit very early, medium to large, round-oblong to oblong-conic; cavity large, broad, mottled with red; stem short, stout; apex protruding; suture shallow except near the cavity; skin thick, tough, heavily pubescent; creamy-white, mottled and splashed with crimson; flesh white stained with red near the skin, firm, meaty, juicy, subacid; quality good to very good; stone of medium size, clinging, oval.

EDGEMONT. Fig. 161. *Edgemont Beauty.* In fruit, Edgemont is not easily distinguished from Late Crawford, the essential differences being that the fruits of Edgemont are more rotund than those of Late Crawford, and the flavor is a little more acid. The trees differ in the greater productiveness of Edgemont and in a little later maturity of the crop. Of the score or more peaches of the Crawford type, Edgemont is distinctly superior to all. Compared with Elberta, with which it must compete in the markets, it is several days later, juicier, and less fibrous, and much excels that variety in quality; and, moreover, though

161. Edgemont. (×½)

the individual peaches are not quite so large, the yield of fruit is even greater. If Edgemont proves adapted to as wide a range of climates and soils as Elberta, it is a new commercial peach of great value. Whether it succeeds in commerce or not, Edgemont is well worth planting in home orchards by virtue of the exceptionally high quality and attractive appearance of the fruit. Edgemont was introduced by the Miller Orchard Company, Edgemont, Maryland, in 1902.

Tree large, vigorous, upright-spreading, productive. Leaves large, obovate, thick; margin crenate; glands globose. Flowers midseason, small, dark pink, single. Fruit late midseason; large, irregular, round-ovate, truncate at the base, with unequal halves; cavity deep, narrow, regular, abrupt; suture shallow; apex mucronate; color light yellow or orange-yellow, with a bronze blush often deepening to a carmine blush; pubescence short, thick; skin thick, tough, separates from the pulp; flesh yellow, stained at the pit, very juicy, slightly coarse and stringy, meaty, mild subacid or sprightly; very good in quality; stone free, large, oval, plump, pointed, with corrugated surfaces.

ELBERTA. Fig. 162. Elberta leads all other peaches in America in number of trees. It is, too, the most popular of all peaches in the markets. The preëminently meritorious character of Elberta is its freedom from local prejudices of either soil or climate—it is the cosmopolite of cultivated peaches. Thus, Elberta is grown with profit in every peach-growing state in the Union, and in nearly all is grown in greater quantities than any other market peach. The second character which

162. Elberta. (×½)

commends Elberta to those in the business of peach-growing is fruitfulness: barring frosts or freezes, the trees load themselves with fruit year in and year out. Added to these two great points of superiority are ability to withstand the ravages of both insects and fungi, large size, vigor, early bearing, and longevity in tree; and large, handsome, well-flavored fruits which ship and keep remarkably well. Elberta, however, is not without faults and serious ones. The trees are not so hardy in either wood or blossoms as might be wished. The peaches fall short in quality; they lack the richness of the Crawfords and the sweetness of the white-fleshed Champion type. Moreover, the pronounced bitter tang, even when the peaches are fully ripe, is disagreeable to some. The stone is large but usually wholly free from the flesh. With these faults, the dominance of Elberta is not wholly desirable, as growers are satisfied with the one variety, and consumers are forced to put up with a peach none too high in quality. Elberta was grown by Samuel Rumph, Marshallville, Georgia, from a seed of Chinese Cling planted in the fall of 1870.

Tree large, vigorous, upright-spreading, dense-topped, hardy, very productive. Leaves 6¾ inches long, 1¾ inches wide, oval to obovate-lanceolate; margin serrate, often in 2 series; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-6 reniform, greenish-yellow glands. Flowers midseason, light pink near the center, darker toward the edges, 1¼ inches across. Fruit midseason, 2¾ inches long, 2½ inches wide, round-oblong or cordate, compressed, usually with a slight bulge at one side; cavity deep, flaring, often mottled with red; suture shallow, deepening toward the apex; apex rounded, with a mamelon or pointed tip; color greenish-yellow changing to orange-yellow, from ¼-¾ overspread with red and with much mottling extending sometimes over nearly the entire surface; pubescence thick and coarse; skin thick, tough, separates from the pulp; flesh yellow, stained with red near the pit, juicy, stringy, firm but tender, sweet to subacid, mild; good in quality; stone free, broadly ovate, varying from flat to plump, sharp-pointed, decidedly bulged on one side with pitted surfaces.

ELBERTA CLING. Elberta Cling was introduced as identical with Elberta in growth of

tree and appearance of fruit, the peaches differing in being clingstones. The fruit was supposed to be superior in quality to that of the typical Elberta, and was said to be better suited for canning. As grown at the New York Agricultural Experiment Station, however, the peaches do not resemble Elberta very closely in either shape or color, nor are they equal to the fruits of Elberta in quality. The variety was first mentioned in a report of the Illinois Horticultural Society in 1904.

Tree vigorous, upright, productive; glands usually reniform. Fruit midseason, large, 2⅓ inches wide, 2½ inches long, round-oblate, halves unequal, bulged near the apex; suture deepens toward the apex which is roundish; skin rich yellow with an attractive blush of deep red; flesh yellow tinged red about the stone, juicy, firm, piquant but not rich; quality fair to good; stone rather large, clinging.

ENGLE. *Engle's Mammoth.* Engle is almost a counterpart of the well-known Late Crawford, from which it differs essentially in earlier ripening of fruit and more productive trees. Before Elberta became the vogue, Engle stood high in the esteem of commercial planters, but the coming of Elberta stopped its career. There seems little doubt that Engle is more productive than either of the two Crawfords, and for those who want the best it is as good as any of this group. One of the faults of the two Crawfords is that the trees are tardy in coming in bearing; Engle is said to bear younger. This variety was grown about 1875 by C. C. Engle, Paw Paw, Michigan.

Tree very large, upright, becoming spreading, tall, hardy, medium in productiveness. Leaves 6¼ inches long, 1½ inches wide, irregularly curled, obovate-lanceolate, thin; petiole ½ inch long, with 1-4 small, globose, greenish-yellow glands. Blossoms midseason, light pink at the center, dark red near the edges, 1⅛ inches across. Fruit midseason; 2 inches long, 2½ inches wide, round-oval, becoming almost oblate in some specimens, bulged near the apex, compressed, with unequal sides; cavity flaring; suture shallow, deepening toward the apex; apex variable in shape; color greenish-yellow changing to orange-yellow, splashed with red; pubescence short, thick, fine; skin thin, tough, separates readily from the pulp; flesh pale yellow, stained with red near the pit, juicy, tender and melting, sweet or pleasantly subacid, mild; good in quality; stone free, ovate, bulged on one side, plump, with pitted surfaces.

EUREKA. In the South, where Eureka originated, the variety seems to have a very good reputation as an early, white-fleshed, semi-free peach. In the North, the variety ripens early, when there are many other good peaches of its type, and it is therefore doubtful whether it will ever have a prominent place in northern peach-growing regions. One quality in particular marks Eureka as worthy of more attention than it now receives—the peaches are exceptionally uniform in size. Though long grown, Eureka deserves further trial. It is a seedling of Chinese Cling, found about 1870 in Bossier Parish, Louisiana.

Tree above medium in size, upright-spreading, round-topped, very productive. Leaves 5 inches long, 1 7/16 inches wide, folded upward, variable in shape, leathery; margin coarsely serrate, glandular; petiole 5/16 inch long, with 2-6 large, reniform glands. Blossoms early, 1¾ inches across, pink. Fruit early; 2½ inches in diameter, round-oval, bulged on one side, compressed, with unequal halves; cavity shallow, abrupt; suture shallow, deepening at the apex; apex rounded, with mucronate tip; color greenish-white or creamy-white, often with a distinct, bright red blush overspreading one-third of the surface, with faint mottlings; pubescence fine, thick, short; skin thin, tender, separates from the pulp; flesh white, tender and melting, very juicy, pleasantly flavored, good; stone free, oval, tapering to a long point, with corrugated and deeply pitted surfaces.

FAMILY FAVORITE. Family Favorite is one of the well-known peaches in the south-central states, but in most respects falls short of Champion, with which it must compete in the North. The tree is doubtfully hardy, and the fruit scabs badly. The variety has two characters to commend it and to give it standing among commercial peaches. Compared with that of Champion, the fruit stands shipment much better, and when brown-rot is rife, does not suffer nearly so much. In selected locations where a midseason, white-fleshed peach is wanted, this variety is worth trying. Family Favorite was raised by William H. Locke, Bonham, Texas. The date of its origin is unknown.

Tree of medium size, spreading, inclined to droop, open-topped, productive. Leaves folded upward, 6 inches long, 1½ inches wide, ovate-lanceolate; margin finely serrate, often in 2 series; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-4 small, globose, greenish-yellow glands. Flowers early, light pink at the center, darker along the edges, 1 inch across. Fruit midseason; 2½ inches in diameter, round-oval, bulged near the apex, compressed, with unequal sides; cavity contracted, narrow, abrupt; suture a line, deepening toward the apex; apex rounded, with a small, mucronate tip set in a depression; color creamy-white, with a few splashes of red showing through a dull and mottled blush; pubescence short, thin; skin thin, tough; flesh greenish-white, strongly stained with red at the pit, very juicy, tender and melting, sweet or subacid, aromatic; good in quality; stone semi-free to free, tinged with red, flattened near the base, elliptical, plump, winged on one side, with roughish and usually pitted surfaces.

FITZGERALD. Fitzgerald and Early Crawford are almost identical in fruit and foliage. There could be no use in growing Fitzgerald, so similar is it to the better-known Early Crawford, were it not for the fact that the fruit is earlier by a few days, and that, possibly, Fitzgerald is the more productive of the two. Canadian peach-growers claim that Fitzgerald, besides being more productive and extending the season of Early Crawford, is hardier. In the effort to maintain peaches of the Crawford family in commercial plantations, it may be worth while to try Fitzgerald. It originated about 1890 at Oakville, Ontario, but who the originator or what the parentage is not known.

Tree of medium size, upright-spreading, round-topped, hardy, not very productive. Leaves 6 inches long, 1½ inches wide, obovate-lanceolate; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-5 small, globose, greenish-yellow glands. Flowers midseason, pale pink varying to a deeper red along the edges, ⅞ inch across. Fruit midseason; 2½ inches long, more than 2½ inches wide, round-oval, somewhat compressed with unequal halves, bulged at one side; cavity medium to deep, wide, flaring, marked with radiating streaks; suture shallow, deepening toward the apex; apex rounded, ending in a recurved, mamelon point; color golden-yellow more or less overspread with a dull red blush, with splashes and mottlings of deeper red; pubescence long, thick; skin thin, tough; flesh yellow, rayed with red at the pit, juicy,

firm, tender, sweet or mildly subacid, pleasantly flavored; very good in quality; stone free, ovate, plump, flattened near the base with pitted surfaces.

FLORIDA GEM. Florida Gem is rated by peach-growers in Florida as one of the best seedlings of Honey for home and commercial purposes. Its ripening date is from a week to ten days earlier than Honey, the crops coming on the markets in Florida the first week in July. The peaches, besides being earlier, are firmer and ship rather better than those of its well-known parent. The variety seems to have been first described in a report to the Florida Station in 1896, but when, where, and by whom originated does not appear. The fruit is described in southern catalogs as follows:

Fruit medium to large, round-oblong, pointed; suture indistinct, often wanting; apex conical, long, recurved; skin fuzzy, thin, tough, pale yellow washed with deep red on the sunny side; flesh firm, juicy, white, red at the stone, sweet, agreeable; quality very good; stone free, oval, red.

FOSTER. Fig. 163. Foster is so similar to Late Crawford that even experienced growers can hardly tell them apart. Those who

163. Foster. (×½)

grow the two in the same orchard find the essential differences to be that Foster is a larger peach than Late Crawford, is more rotund, somewhat more flattened at the base, is a little earlier, possibly handsomer, and is even of better quality; the trees of Foster, however, are hardly so productive as those of either of the two unproductive Crawfords. This unproductiveness is the fault that keeps the variety in the background as a commercial peach. The variety is worth planting in home orchards. Foster originated about 1857 with J. T. Foster, Medford, Massachusetts.

Tree very large, vigorous, upright-spreading, hardy, variable in productiveness. Leaves 6 inches long, 1½ inches wide, folded upward, oval to obovate-lanceolate, leathery; margin finely serrate; teeth tipped with small glands; petiole ½ inch long, with 1-4 small globose glands. Blossoms midseason, large, pale pink. Fruit midseason; 2½ inches in diameter, round-cordate, often bulged at one side, compressed, with unequal sides; cavity deep, wide, abrupt, often splashed with red; suture shallow, becoming deeper at both apex and cavity and extending slightly beyond the point; apex rounded or pointed, with a recurved, mamelon or occasionally mucronate tip; color deep yellow overspread with dark red, with a few splashes or stripes of red; pubescence long, thick; skin thick, tough, separates from the pulp when fully ripe; flesh deep yellow, faintly stained with red near the pit, juicy, coarse and stringy, firm but tender, sweet, mild, spicy; very good in quality; stone free, small, oval, pointed at the apex, pitted.

FOX. *Fox Seedling.* This comparatively old sort seems to have taken on new life in all of the southern states, and is listed in several southern catalogs. It was placed in the fruit catalog of the American Pomological Society in 1891, dropped in 1897, and replaced in 1899. The variety originated in New Jersey sometime previous to 1890, but where and when does not appear.

Tree vigorous, upright-spreading, productive, hardy; glands globose. Fruit late, medium to large, round, slightly compressed; suture extending nearly around the fruit; skin creamy-white with red blush; flesh white, red at the pit, mild, juicy, sweet with a rich vinous flavor; quality very good; stone oval, of medium size, free.

FRANCES. The great desideratum of peach-growers is a good market variety to follow Elberta. Of a score or more advertised to fill this particular niche in peach-growing, Frances is one of the best. The fruits average as large as those of Elberta, or, at most, fall short of it but a trifle; they are handsomer than those of Elberta, having a richer background of yellow and more brilliancy in the red cheek; are more nearly round and more uniform in size and shape; the quality is much the same as that of Elberta, the difference in flavor, texture, and juiciness being in favor of Frances. But the chief right of Frances to a place in pomology arises from the fact that it extends the Elberta season a few days or a week. All that is known of the history of Frances is that it came from Texas about 1900.

Tree very large, tall, upright, slightly spreading, hardy, productive. Leaves oval to obovate-lanceolate, large, thin, and leathery. Fruit late, season long; 2¾ inches long, 2½ inches through, round-oval, slightly oblique, halves unequal, bulged at apex; cavity medium in depth and width, slightly flaring; suture shallow, deepening toward apex; apex roundish; color deep lemon-yellow, specked and widely splashed with dull red on a lively blush cheek; dots small, numerous, rather conspicuous; pubescence short, thin; skin thin, tough, separating readily; flesh yellow, red at stone, juicy, moderately coarse, tender, fibrous, pleasing subacid, rich, sweet, vinous; good to very good; stone free.

GENERAL LEE. *R. E. Lee. Lee.* General Lee is a white-fleshed clingstone, the fruit none too attractive and surpassed in quality by that of other varieties of its season. It is without value in the North. Southern growers say General Lee is an improved Chinese Cling, and as such well worth growing under some conditions. Tree and fruits are susceptible to brown-rot. The variety, as its history shows, really belongs to eastern Asia, and thus arouses interest. General Lee originated with Judge Campbell, Pensacola, Florida, from pits brought from Japan in 1860.

Tree very large, vigorous, spreading, unproductive. Leaves 6¼ inches long, 1½ inches wide, flat or folded downward, oval to obovate-lanceolate, thick, leathery; margin coarsely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-4 large, reniform, reddish-brown glands. Blossoms midseason, 1¾ inches across, pink. Fruit midseason; 2½ inches in diameter, round-oval, compressed, with halves equal;

cavity deep, medium to wide, contracted around the sides, flaring, often mottled with red; suture medium to deep, extending beyond the tip; apex mucronate, mamelon; color greenish-white changing to creamy-white, with a dull or lively red blush in which are intermingled a few splashes of duller red; pubescence coarse, long, thick; skin thick, tough, clings to the pulp; flesh white, stained with red near the pit, juicy, stringy, tender, sweet but sprightly, pleasantly flavored; good in quality; stone clinging, bulged on one side, broadly oval to ovate, flattened, short-pointed at the apex, with pitted surfaces.

GEORGE IV. Once one of the mainstays of American peach-growing, George IV is now of but historical interest. It was one of the first named American peaches, and had the honor of being placed on the recommended list of fruits at the first meeting, in 1848, of the National Convention of Fruit-Growers, an organization which became the American Pomological Society. George IV is not worth planting now, and is described only that fruit-growers may note progress in the development of peaches. While little grown here, this old American peach is still widely grown in Europe.

Tree large, vigorous, upright-spreading, hardy, unproductive. Leaves 7 inches long, 1½ inches wide, obovate-lanceolate, thick, leathery; margin sharply serrate, red; petiole ½ inch long, glandless or with 1-3 small, globose, reddish-brown glands. Flowers midseason, pale pink, with white centers and edged with darker pink, 1 inch across. Fruit midseason; 2½ inches in diameter, round-oblate, bulged near the apex; oblique, with unequal sides; cavity slightly contracted, deep, wide, abrupt, with tender skin; suture shallow, becoming deeper at both apex and cavity and faintly showing beyond the tip; apex rounded, with a mucronate tip; color creamy-white, with a pink blush and mottlings of red; pubescence short, thick, fine; skin thin, tough, variable in adherence to the pulp; flesh white, deeply tinged with red near the pit, juicy, stringy, tender, mild, pleasantly flavored; good in quality; stone semi-free, round-oval, very plump, flattened at the base, tapering to a short, rounded point, with grooved surfaces.

GEORGE LATE. George Late is a white fleshed clingstone which has the reputation of being one of the most profitable of the late clings in the northern counties of California. The peaches ship well, are attractive in appearance, and of very good quality. The variety originated near Sacramento, California, and was first described in a report of the California Board of Horticulture in 1891. The fruits are described as follows:

Fruit late, large; skin pale yellow striped and splashed with bright red; flesh white stained with red at the pit; stone small, clinging rather tenaciously.

GLOBE. While rapidly passing from cultivation, Globe is still mentioned in the catalogs of a few nurserymen. The fruit is seldom found on the markets, but is grown in some peach regions for home use. Globe is a chance seedling from Berks Center, Pennsylvania, and originated sometime previous to 1885.

Tree rapid and vigorous grower, hardy, usually productive; glands globose; flowers small, pink, midseason. Fruit midseason, large, round-oval; cavity broad; skin yellow with red cheek; flesh yellow, vinous, sprightly; quality very good; stone large, oval, plump, free.

GOLD DROP. Fig. 164. Gold Drop, long a familiar peach in Michigan orchards, is not much grown elsewhere. The variety has several distinctive peculiarities which make it a pleasing variation. Thus, its transparent, golden skin and flesh make it one of the handsomest of all peaches; add to handsome appearance a somewhat distinctive flavor—vinous, rich, refreshing—and the peach becomes very good, one that, were the size larger, would sell in any market. Gold Drop is further characterized by trees of great hardiness and remarkable productiveness. The variety

164. Gold Drop. (×½)

is also about the least susceptible to brown-rot and leaf-curl. Earliness in coming in bearing is another admirable character. The trees are small, dainty in habit, with clean, fresh foliage, making the variety an attractive ornamental. All in all, Gold Drop is an ideal variety for the home garden, and has many good characters which can be used as stepping-stones in breeding peaches. It is an old sort believed to be another variety renamed.

Tree of medium size and vigor, spreading, open-topped, hardy, very productive. Leaves 5½ inches long, 1¼ inches wide, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with red along the edge; petiole ½ inch long, with 2-9 large, reddish-brown or grayish, mixed glands on the leaf. Flowers early, pale pink, 1¾ inches across. Fruit late; 2½ inches in diameter, round-oval, bulged at one side, with unequal halves; cavity deep, abrupt, twig-marked; suture very shallow; apex rounded, with a mamelon tip; color golden-yellow, with a dull blush on one side; pubescence thick, coarse; skin adhering to the pulp; flesh pale yellow to the pit, pleasantly sprightly; good in quality; stone free, broadly ovate, bulged at one side, with a pointed apex and deeply grooved surfaces.

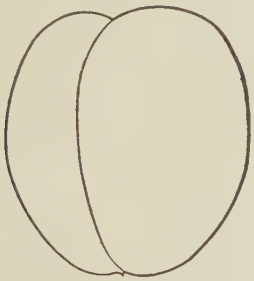
GOVERNOR HOGG. *Governor.* Were it not that Governor Hogg must compete with the well-established Greensboro and Carman, it would be worth trying in commercial plantings. The fruit ripens a few days after that of Carman, is larger and handsomer and as good in quality. In both appearance and quality, the peaches excel those of Greensboro, the size, shape and color being much the same, although the color in this variety runs more to soft tints of red. The flesh is firm, tender, and delicate, and the peaches ought to stand shipment well. Like all early, white-fleshed peaches, Governor Hogg is quite susceptible to leaf-curl and brown-rot. The variety seems to have originated with a Mr. McClung, Tyler, Texas, about 1892.

Tree large, upright-spreading, open-topped, hardy, variable in productiveness. Leaves 5½ inches long, 1½ inches wide, oval-lanceolate, leathery; margin finely

PLATE VIII.—DE SOTO PLUM.

serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-5 reniform, reddish-brown glands. Blossoms midseason, medium in size, pale pink. Fruit early, 2¼ inches in diameter, oblong-oval, compressed, oblique; cavity deep, narrow, abrupt; suture shallow, becoming deeper at the cavity; apex depressed, with a mucronate tip; color creamy-white, blushed with red; pubescence short; skin thin, separates from the pulp; flesh white, juicy, stringy, meaty; good in quality; stone clinging, obovate, plump, strongly bulged on one side, conspicuously winged, pointed at the base, with the surfaces grooved and pitted.

GREENSBORO. Fig. 165. *Balsey.* Greensboro is one of the leading early, white-fleshed peaches. It takes high place because of its showy fruits and its large, vigorous, healthy, early-bearing, and prolific trees. In the last



165. Greensboro. (×½)

character, in particular, Greensboro is almost supreme—year in and year out, its trees are fruitful. Possibly no other white-fleshed peach is adapted to a greater variety of soils than Greensboro—a quality which makes it suitable for wide variations in peach-regions. The peaches, while handsome, are in no way remarkable, the quality being rather inferior, so that it is the tree that gives Greensboro its standing. The variety is well thought of by fruit-dealers, because the fruits carry well and keep long. Possibly the peaches are less susceptible to brown-rot than most other varieties of Greensboro's season, but to offset this advantage there are many cracked pits and accompanying malformed fruits. Picked green, the stone clings; picked at maturity, the flesh is free. Greensboro is a seedling of Connett grown by W. G. Balsey, Greensboro, North Carolina, about 1891.

Tree very large, spreading, open-topped, hardy, very productive. Leaves 6½ inches long, 1½ inches wide, recurved, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-5 reniform, reddish-brown glands. Flowers early, pale pink, 1¾ inches across, usually in twos. Fruit early; 2½ inches in diameter, oblong-oval, often oblique, bulged at one side, compressed, with unequal sides; cavity deep, narrow, abrupt; suture shallow, deepening toward the cavity; apex rounded, with a small, mucronate tip; color creamy-white, blushed with red, with a few stripes of darker red intermingling; pubescence heavy, nearly tomentose; skin tough, separates from the pulp; flesh white, very juicy, tender and melting, mild, sweet, sprightly; fair in quality; stone semi-clinging, ovate, strongly bulged along one side, with short grooves on the surfaces.

HALE EARLY. *Hale.* In the middle of the last century, Hale Early was considered the best peach of its season for home and market. Even now it has several characters to recommend it: as, large, vigorous, hardy, healthy, productive trees; fruits handsome in color, uniform in size and shape, with flesh more than ordinarily free from the stone for an early peach, fair quality for the season, and extreme earliness. The chief fault is that the peaches run small in size, scarcely exceeding large marbles, which they resemble in roundness. The variety must be grown in the best of peach lands, heavily thinned, and the trees severely pruned. The peaches are very susceptible to brown-rot. Nowhere very commonly planted, the variety is still widely distributed. Hale Early grew from a seed planted in 1850 by a German named Moas at Randolph, Ohio.

Tree large, vigorous, upright-spreading, hardy, variable in productiveness. Leaves flat or curled downward, 6¼ inches long, 1¼ inches wide, long-oval, thin, leathery; margin finely serrate, often in 2 series; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-4 small, globose, reddish-brown glands. Blossoms midseason, dark pink at the center, lighter toward the margin and with streaks of light pink along the veins, 1½ inches across, usually single. Fruit early; 1¾ inches in diameter, round, slightly compressed, with unequal halves; cavity regular, deep, wide, flaring; suture shallow, with a slight bulge near the apex; apex rounded or flattened, ending abruptly in a short, sharp, recurved point; color creamy-white, blushed over one-half the surface; pubescence short, thick; skin tough, free; flesh white, juicy, tender, sweet, with some astringency; good in quality; stone semi-free, oval, plump, with a short-pointed apex, surfaces marked by short grooves.

HALL YELLOW. Hall Yellow is a peach of the Peento type, said to be a seedling of Angel. It is grown rather commonly in Florida as a home fruit, the peaches being esteemed for their high quality. The variety originated with R. C. Hall, Volusia County, Florida, about 1900. The fruits are described as follows:

Fruit early, large, round-oblate to round-oblong, bulged on one side; suture very shallow; apex rounded; skin yellow washed with red; flesh yellow, red at the stone with red lines radiating in the flesh; firm, juicy with a rich and very agreeable flavor; quality good to very good; stone of medium size, free.

HEATH CLING. *Heath. White English.* Heath Cling is the oldest named American peach now under cultivation. For its tree-characters and for at least one fruit-character it ought to be retained for breeding. Thus, few varieties have larger, healthier, hardier, trees; and of all American peaches, the fruits keep longest, often keeping in good condition from October to December. Well-grown, the peach has a sweet, rich, vinous taste, but the flesh adheres so tightly to the stone that it is not pleasant eating out of hand, although excellent cooked, preserved, or pickled, as the stone in culinary preparations imparts a pleasant flavor of peach-pit bitterness. Just how old Heath Cling is no one knows, but it probably was grown in the colonies before the Revolution.

Tree large, vigorous, upright-spreading, hardy, unproductive. Leaves 6¼ inches long, 1½ inches wide, obovate-lanceolate, leathery; margin finely serrate; teeth

tipped with reddish-brown glands; petiole ½ inch long, with 2-7 small, mostly reniform, reddish-brown glands. Blossoms midseason, a faded pink, white at the center of the petals, ¾ inch across. Fruit very late; 2¼ inches in diameter, round-oval, compressed and somewhat angular, with unequal sides; cavity variable in depth and width, flaring; suture shallow; apex ending in a swollen, pointed tip; color creamy-white, blushed with red, splashed and mottled with darker red; pubescence short, thick, fine; skin thin, adhering to the pulp; flesh white, juicy, firm, tender, sweet or somewhat sprightly; good in quality; stone clinging, oval, plump, flattened and pointed toward the base, tapering to a short point at the apex, with dark brown, grooved surfaces.

HEATH FREE. *Heath.* Heath Free is now rarely planted, being replaced by better sorts. The tree-characters of the variety seem to be very good, but the fruits are poor in quality. Possibly it is worth growing under some conditions as a late, white-fleshed peach. Heath Free is another old variety, a native of New England. Kenrick, one of the first American pomologists, received the variety from General Heath, Roxbury, Massachusetts, early in the nineteenth century.

Tree very large, vigorous, upright-spreading, open-topped, unproductive. Leaves 7 inches long, 1¾ inches wide, folded upward, recurved slightly, long-oval to obovate-lanceolate, rather thin; margin finely serrate, with reddish-brown glands; petiole ½ inch long, with 2-5 reniform, reddish-brown glands. Flowers midseason, dark pink along the margins of the petals changing to white toward their centers. Fruit late midseason; 2¼ inches in diameter, round-oval, often strongly compressed, with halves nearly equal; cavity medium to shallow; apex roundish, with a depressed, mucronate tip; color creamy-white, blushed or mottled with red, with splashes of deeper red; pubescence rather coarse, thick; skin thick, tough, adherent to the pulp; flesh white, bronzed at the pit, juicy, coarse, firm but tender, mild subacid with some astringency; good in quality; stone free, flattened near the base, oval, with long grooves deeply sunken in the surfaces.

HILEY. Fig. 166. *Early Belle.* In spite of keen competition with many other early, white-fleshed peaches, there seems to be a place for Hiley. Two characters make it

166. Hiley. (×½)

notable in its class: it is the earliest commercial freestone, white-fleshed peach; and it is rather better in quality than most of its competitors. Well grown, the peaches are large in size and handsomely colored, but they are not quite so uniform in either size or color as could be desired for a commercial variety. The trees, while productive, are neither large nor sufficiently hardy and vigorous to make an ideal commercial sort. The fruits are easy prey to brown-rot. Hiley originated with Eugene Hiley, Marshallville, Georgia, about 1886.

Tree medium in size, lacking in vigor, upright-spreading, open-topped, very productive. Leaves 6¼ inches long, 1½ inches wide, narrow-oval to obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1 to 8 small, globose and reniform, greenish-yellow glands. Blossoms midseason, pink, 2 inches across, often in twos; pedicels glabrous, greenish; calyx-tube dull, dark reddish-green, greenish-yellow within. Fruit midseason; 2½ inches in diameter, oblong-conic, bulged near the apex, with unequal halves; cavity abrupt, the skin tender and tearing easily; suture shallow, deepening toward the apex; apex pointed; color greenish-yellow with a dull blush over ½ the surface, more or less mottled; pubescence thick, fine, short; skin thin, tough, separates from the pulp when fully ripe; flesh creamy-white, stained red at the pit, stringy, firm but tender, with a distinct, pleasant flavor, sprightly; good in quality; stone free, pointed at both ends, with nearly smooth surfaces.

HOBSON. *Hobson Cling.* Hobson is a showy red-cheeked, white-fleshed clingstone, strongly recommended several years ago in Texas, but now mentioned in only a few of the catalogs of the southwestern states. It is said to be a seedling of Mamie Ross, grown by E. W. Kirkpatrick, McKinney, Texas, and was first described in the report of the Delaware Experiment Station in 1901. The variety seems not to be known in northern or western states. The Delaware Station describes the fruit as follows:

"Fruit early, medium size, oval, compressed; apex uneven, blunt; skin firm, thick, creamy-white faintly blushed; flesh firm, moderately juicy, astringent; stone clinging, short, blunt; good for canning."

HONEY. Honey is the type plant of a group of Chinese peaches, the chief strain of which, as grown in this country, was raised from seed sent from China to Charles Downing, Newburgh, New York, some time previous to 1858. Peaches of this group reproduce from seed nearly true to type, and a number of strains of Honey are to be found in America under the one name; there are, also, a considerable number of named strains. The variety and its offspring thrive only in the Gulf states and in the warmer parts of California.

Tree vigorous and productive, hardy only in the South; glands usually reniform but sometimes globose. Fruit midseason in the South, small to medium, oblong-oval tapering at the apex into a long, sharp beak; skin pale yellow, washed and dotted with red which deepens almost to a crimson blush; flesh creamy white, streaked with red around the pit, juicy, very tender, melting, distinct rich, honey-like flavor; quality very good to best; pit of medium size, oval, free.

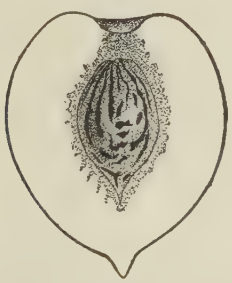
ILLINOIS. Fig. 167. Illinois is a midseason, white-fleshed, freestone peach, still on probation, with what result as to commercial possibilities it is impossible to predict, since growers in peach-regions are not in accord as to its value. In size, color, and shape of fruit, Illinois is one of the beauties of the orchard. Yet, all things considered, the new variety is not so good as Champion, with which it would have to compete. Neither tree- nor fruit-characters are quite satisfactory. It must be apparent, also, to all peach-growers that the

industry is overloaded with white-fleshed peaches, which must be sold in nearby markets or grown for home use. Illinois originated about 1910 on the grounds of E. H. Riehl near North Alton, Illinois.

167. Illinois. (×½)

Tree medium in size and vigor, upright to spreading, hardy, very productive. Leaves 5½ inches long, 1½ inches wide, curled under at the tips, ovate-lanceolate, thin, leathery; margin deeply and sharply serrate, the serrations often in 2 series; teeth tipped with small glands; petiole ½ inch long, glandless. Blossoms midseason, variable in color, 1 inch across, often in twos. Fruit early midseason; 2½ inches in diameter, round-oblate, compressed, the halves usually unequal; cavity deep, abrupt, often tinged with red; suture shallow, deepening toward the apex; apex rounded, with a mucronate tip; color creamy-white, blushed with dull, dark red and mottled with splashes of brighter red; pubescence heavy; skin tough; flesh white, stained red near the pit, juicy, tender and melting, sweet; good in quality; stone semi-free to free, obovate, elongated toward the base, plump, short-pointed at the apex, with grooved and pitted surfaces.

IMPERIAL. Fig. 168. Of the several honey-flavored peaches, Imperial is one of the best. The fruit is not easily distinguished in appearance from that of Climax, and is also rather closely allied to Honey in outward char-



168. Imperial. (×½)

acters, but has a somewhat distinct flavor in which it surpasses Climax and Honey. It differs from both, also, in time of ripening. The peaches drop badly as they mature. Imperial is worth a place in every home orchard where it does not have to brave too great a degree of cold; and peach-breeders should seize the opportunity to cross it with less richly flavored northern varieties. Imperial is a seedling of Honey grown in 1890 by G. L. Taber, Glen Saint Mary, Florida.

Tree medium in size or small, upright-spreading, round-topped, productive. Leaves 6¼ inches long, 1½ inches wide, flat, lanceolate, leathery; margin finely and shallowly serrate; teeth tipped with glands; petiole ½ inch long, with 1-4 small, reniform glands. Blossoms midseason; medium in size, showy, light pink, usually single. Fruit late; 2½ inches long, 2¼ inches wide, oval, with unequal halves; cavity shallow, medium in width, flaring; suture very shallow, often indistinct toward the cavity; apex distinctly elongated; color whitish, with faint mottlings and a distinct blush; pubescence short, thick; skin tough, adhering to the pulp; flesh white, stained with red near the pit, juicy, fine-grained, tender and melting, very sweet and of a delightful flavor; very good to best; stone free, bulged at one side, long and pointed at the apex, with rough, pitted surfaces, dark brown mingled with purplish-red.

IRON MOUNTAIN. Fig. 169. Hardiness is the outstanding character which has brought Iron Mountain into prominence. The introducer claims extreme hardiness of wood and bud for the variety; others say that it is surpassed in hardiness by Crosby, Wager, and other varieties of their type. Iron Mountain is a very late, white-fleshed, freestone peach,

169. Iron Mountain. (×½)

well adapted for extending the commercial limits for this fruit in regions where fall frosts hold off sufficiently long for the fruit to ripen. The tree-characters are very satisfactory, and the peaches serve very well for culinary purposes, but are not sufficiently attractive for a dessert fruit. There seem to be two varieties passing under this name, much alike in fruit; one is large-flowered, the other small-flowered. This variety might well be planted for some markets; as, for example, near towns and cities where it is desirable to extend the local market as late as possible. Iron Mountain originated in New Jersey about 1890, but nothing is known of its parentage or its originator.

Tree large, vigorous, upright-spreading, open-topped, not always productive. Leaves 6 inches long, 1½ inches wide, folded upward and recurved, obovate-lanceolate, leathery; margin glandular, finely serrate; petiole ½ inch long, with 1-6 reniform glands of medium size. Flowers late, small, pale pink. Fruit very late; 2¾ inches long, 2½ inches thick, oblong-oval, often bulged on one side, compressed; cavity contracted, below medium in depth, flaring; suture shallow, extending only to the tip; apex distinctly mucronate or rounded, sometimes tapering; color creamy-white, occasionally with a light blush; pubescence heavy; skin medium to thin, tender, adherent to the pulp; flesh white, stained brown next to the pit, juicy, tender, sweet, mild; quality good; stone semi-free, wedge-like at base, obovate, plump, long-pointed at the apex, winged, with large, wide and deep grooves in the surfaces.

J. H. HALE. Fig. 170. Of many new peaches, J. H. Hale is the leading aspirant for pomological honors. Its characters can be best set forth by comparing it with Elberta, the standard commercial peach. In size, the fruit of J. H. Hale averages larger; the flesh is firmer and heavier; the peaches ship better and keep longer than those of Elberta. In shape, the

170. J. H. Hale. (×½)

fruit is almost a sphere, its perfect symmetry being scarcely marred by the suture, so that it is more shapely than the oblong Elberta, and can be packed to better advantage. In color, there is no choice; both peaches are voluptuously handsome. The skin of the J. H. Hale fruit is less pubescent and possibly a little firmer and tighter, characters adding to appearance and shipping qualities. It is but an invitation to argument to say which is the better in flavor, aroma, texture, and juiciness; neither can be rated as extra good. J. H. Hale ripens its fruit a few days earlier than Elberta, and its trees and buds are hardier than those of Elberta. Which is the more productive is not certain. The greatest asset of Elberta is its ability to adapt itself to diverse soils; whether J. H. Hale is equally elastic in constitution remains to be seen. The variety is still on probation with the chances growing stronger each year that it will take high place among commercial peaches. The new variety will not drive Elberta from the markets, but the markets will be shared between the two, J. H. Hale reaching the fruit-stands several days in advance of Elberta. This remarkable variety is a chance seedling found by J. H. Hale, South Glastonbury, Connecticut. The distribution of the variety was begun by Stark Brothers, Louisiana, Missouri, in 1912, and possibly no other tree-fruit has ever been so rapidly propagated and so widely distributed.

Tree vigorous, upright-spreading, open-topped, productive. Leaves 6¾ inches long, 1¾ inches wide, recurving at the tip, lanceolate, thin, leathery; margin singly or doubly serrate; petiole ¼ inch long, thick, with 1-5 reniform, dark brown glands of medium size. Flowers midseason, light pink near the center, darker near the edges, 1¼ inches across. Fruit midseason; 3 inches in diameter, regular, round, with equal halves; cavity deep, wide, regular; suture a mere line, very shallow or with almost no depression; apex rounded, with a small tip set in a depression; color lemon-yellow overspread with dark red and with mottlings and splashes of carmine; pubescence light; skin thick, tough, separates but poorly from the pulp; flesh yellow, red around the pit, juicy, fine-grained, sweet or somewhat sprightly; good in quality; stone free, oval, plump, flattened at the base, pointed at the apex, with grooved and pitted surfaces.

KALAMAZOO. Before Elberta was introduced, Kalamazoo was a promising yellow-fleshed, freestone variety. The fruit is better in quality than Elberta, but not so showy in appearance, and the trees are not quite so productive. Kalamazoo ripens with Late Crawford, and well competes with that variety, for the trees are hardier in wood and bud, and are much more productive. The variety falls short, however, in the size of the peaches, which run no larger than a medium Late Crawford. The fruits are of highest quality either for dessert or culinary purposes. The trees are susceptible to leaf-curl and must be thoroughly sprayed. This variety is grown rather extensively in Michigan and is well known in parts of New York. Kalamazoo originated with J. N. Stearns, Kalamazoo, Michigan, about 1869, as a sprout below the bud on a Yellow Alberge tree.

Tree large, spreading, vigorous, open-topped, very productive. Leaves 6½ inches long, 1½ inches wide, nearly flat or curled downward, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-6 small, reniform, reddish-brown glands. Blossoms midseason, pale pink, white at the center of the petals, 1⅛ inches across. Fruit late; 2½ inches in diameter, round-oval, often compressed, with unequal sides; cavity wide, abrupt; suture indistinct, becoming more pronounced toward the tip; apex ending in a small, elongated point; color yellow, with a distinct blush extending over one-fourth of the surface, mottled; pubescence thick, fine; skin thin, tough, separates from the pulp; flesh light yellow, stained with red near the pit, juicy, tender, sweet, mild; good in quality; stone free, ovate, bulged on one side, winged near the base, the surfaces pitted and grooved near the apex.

KRUMMEL. Krummel is a favorite variety in southern peach regions and is somewhat grown in New Jersey, Maryland, and the Pacific states. It seems to be a very valuable variety where a late peach is wanted. In the regions named, the trees are said to be more productive and somewhat hardier than those of Salwey, with which the variety must compete. It is seldom to be found in northern peach orchards. Krummel originated with a man of the same name, in St. Louis, Missouri, some time previous to 1900. The fruit is described as it grows at the Ohio Experiment Station, Wooster, Ohio, as follows:

"Large, globose, one-sided, enlarged conspicuously at base; suture made distinct by one side of fruit being much swollen; apex very prominent, pointed; color light lemon yellow very faintly blushed with carmine; flesh yellow, red at pit, very fine in texture, juicy and melting; quality good though a little acid; refreshing; pit free; the latest peach grown at this Station."

LATE CRAWFORD. Fig. 171. *Crawford's Superb Malacatune. Crawford's Late Melocoton.* Late Crawford is at the head of the Crawford family, long dominant among the several groups of American peaches, and not yet equalled in quality by any other yellow-fleshed peaches. Late Crawford, a quarter-century ago, began to give way to

Elberta because of the greater productiveness of the Elberta tree and the showier Elberta fruits, and now, though widely distributed, is nowhere largely planted and seems likely to pass out of cultivation as a peach of commerce. Unproductiveness and tardiness in coming in bearing are the faults on account of which Late Crawford is failing. Itself adapted to a wide range of soil and climatic conditions, Late Crawford, through the recurring variations from seed, has made the Crawford family the most cosmopolitan of the several distinct races of American peaches. Compared with other

171. Late Crawford. (×½)

Crawford-like peaches, Late Crawford is possibly the best in fruit-characters, the peaches being unsurpassed in appearance, and scarcely equalled in texture of flesh and richness of flavor. The fruits are more shapely than those of other Crawford varieties, being more uniform, rounder, trimmer in contour, and having a suture that scarcely mars the symmetry of the peach. In color, Late Crawford runs the whole gamut of the soft tints of red and yellow that make Melocotons and Crawfords the most beautiful of all peaches. The trees are as vigorous, hardy, healthy and as little susceptible to disease as any of the varieties of kin, failing only in productiveness and in coming in bearing tardily. Evidently destined to pass from commercial cultivation, Late Crawford ought long to remain one of the treasures of the home orchard. This excellent peach was raised by William Crawford, Middletown, New Jersey, at least a hundred years ago.

Tree large, vigorous, upright-spreading, open-topped, not very productive. Leaves 6⅞ inches long, 1¾ inches wide, folded upward and curled downward; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-6 small, globose, reddish-brown glands. Flowers midseason, 1 inch across, pink. Fruit late; 2¾ inches in diameter, round-oval, compressed, with unequal halves; cavity deep, medium to narrow, flaring; suture shallow, deepening toward the apex; apex rounded with a slightly pointed and swollen beak-like tip; color deep yellow, dully or brightly blushed, with the red cheek splashed with darker red; pubescence short, fine; skin thick, tough, separates readily from the pulp; flesh yellow, strongly stained with red at the pit, juicy, firm but tender, sweet but sprightly, richly flavored; very good in quality; stone free, ovate, flattened, bulged on one side, blunt-pointed, flattened near the base, with surfaces deeply pitted and grooved.

LEMON FREE. *Lemon.* Lemon Free is a yellow-fleshed, freestone, lemon-shaped, lemon-colored peach ripening in late midseason. The fruit is not sufficiently attractive in appearance to sell well in the markets; it is too thin-skinned to ship or keep well; but the quality is very good, the flavor being sweet, rich and delicious. It is an excellent peach for culinary purposes, having the reputation of making a handsomer canned product than any other peach. Lemon Free is little grown in the eastern states, but it is one of the leading sorts of its season in California. This variety seems to have originated in Ohio, about 1885, but nothing is known of its parentage, originator, or introducer.

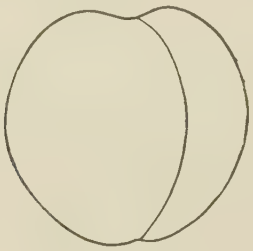
Tree very large, vigorous, upright-spreading, dense-topped, hardy. Leaves 7 inches long, 1¾ inches wide, obovate-lanceolate, thick, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 2-6 large, reniform, reddish-brown glands. Flowers midseason, medium size, pale pink. Fruit late midseason; 2½ inches in diameter, round-oval; cavity medium to deep, wide, flaring, often mottled with red; suture shallow, becoming deeper at the apex and extending beyond; apex mucronate to round-mamelon, recurved; color green or golden-yellow, with a faint blush and mottled with red; pubescence fine, long, thick; skin thin, tender, variable in adhesion to the pulp; flesh yellow, juicy, stringy, tender and melting, sweet, sprightly, pleasantly flavored; very good in quality; stone semi-free to free, oval, plump, flattened near the base, short-pointed, the surfaces usually grooved and with few pits.

LEVY. *Henrietta. Levy Late.* Levy is a round, yellow-fleshed clingstone of very good quality which ripens quite too late for any but the most favorable peach-sections in the North. It is one of the favorite peaches to close the season in southern fruit-growing sections. The variety is old and was first introduced as Henrietta.

Tree large, vigorous, upright to quite spreading, hardy, productive. Leaves 6½ inches long, 1½ inches wide, lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ¼ inch long, with 1-6 small, globose, reddish-brown glands. Blossoms midseason; 1 inch across, with varying shades of pink, sometimes in twos. Fruit very late; 2½ inches in diameter, round-cordate, compressed, with very unequal halves; cavity medium to deep, wide, abrupt, with tender skin and often twig-marked; suture deep, extending beyond the tip; apex mamelon, recurved; color golden-yellow, with splashes of dull red and a lively blush covering one cheek; pubescence short, thick, fine; skin thick, adherent to the pulp; flesh yellow, juicy, stringy, meaty, mild or somewhat astringent, pleasantly flavored; fair to good in quality; stone clinging, bulged on one side, oval, plump, winged, with surfaces marked by short, red grooves.

LOLA. Fig. 172. *Miss Lola.* Lola is a popular peach in parts of the South, but is hardly known in the North. The crop follows that of Mamie Ross and Greensboro, both of which Lola surpasses in appearance and quality of fruit, but precedes that of Champion. The fruits ripen with those of the well-known Carman, so that fruit-growers will want to know how Lola compares with that variety. The tree is hardier than that of Carman; and the fruit is of better quality, larger, but hardly so well colored. The peaches are handsome and of best quality. The variety originated

from seed planted in 1876 by J. W. Stubenrauch, Mexia, Texas, who named it Miss Lola in honor of his daughter.



172. Lola. (×½)

Tree large, vigorous, upright-spreading, open-topped, hardy, productive. Leaves 6 inches long, 1½ inches wide, obovate-lanceolate, thin; margin finely serrate to nearly crenate, glandular; petiole ½ inch long, with 1-5 reniform glands. Flowers early, 2 inches across, light to dark pink, usually in twos. Fruit early midseason; 2½ inches in diameter, round-oval, usually oblique, compressed, with nearly equal halves; cavity deep, wide, abrupt, with tender skin; suture shallow, deepening toward the tip; apex small, mucronate, rounded or somewhat depressed; color creamy-white blushed with carmine deepened by a few dark splashes; pubescence short, thin; skin thin, tough, separating from the pulp; flesh white, rayed with red near the pit, very juicy, tender and melting, sweet with a pleasant sprightliness; good in quality; stone semi-free to free.

LOVELL. Little known in the East, Lovell is one of the most widely planted of yellow-fleshed freestones in California, where it has the reputation of being the best canning, drying, and shipping freestone, as the flesh is often heavier than that of Muir, which this variety follows in season. The trees are remarkable for their vigor and productiveness, but are said to be susceptible to leaf-curl in some regions. The variety originated as a chance seedling with G. W. Thissell, Winters, California, in 1882.

Tree very vigorous, spreading, somewhat drooping, very productive; glands globose; flowers small, appearing in midseason, heavily tinged with red. Fruit midseason, 2½ inches wide, 2½ inches in diameter, round, compressed; suture distinct, extending beyond the apex; skin bright yellow with a faint marbled blush; flesh yellow to the pit, firm, heavy; quality good to very good; stone small, round-oval, free.

McDEVITT CLING. This variety is recommended as one of the very good late yellow-fleshed clingstones for California. The peaches are said to be excellent for canning and ship well also. The variety originated with Neal McDevitt, Placer County, California. Nursery catalogs describe the fruits as follows:

Fruits very large, uniform, golden-yellow becoming red when ripe; flesh very firm and solid; superior in flavor, canning and shipping well; season late or the last of August in California.

McKEVITT CLING. This white-fleshed clingstone is largely grown in parts of California. The variety is much prized for canning, and because of the high quality of the fruit is largely planted for home orchards. The peaches ship well but are not generally grown for distant markets. McKevitt Cling originated as a chance seedling with A. McKevitt, Vaca Valley, California, some time previous to 1882.

Tree large, upright, vigorous, round-topped, productive; glands globose. Flowers small, tinged with pink, midseason. Fruit midseason, large, round-oval; suture distinct; apex prominent; color creamy-white, marbled with bright red; flesh moderately juicy, faintly tinged with red at the pit, firm, sweet, richly flavored; quality very good to best; stone of medium size, oval, pointed, clinging rather tenaciously.

MAMIE ROSS. Mamie Ross seems to have a very good reputation as a table and market peach in Texas and other parts of the South, but is hardly worth growing in the North. The fruits have two bad faults: the quality is not high, the flesh being coarse, juicy, and insipid in flavor; and the peaches bruise with the least possible handling, so that they cannot be shipped to advantage. Mamie Ross comes at a season when there are many other good midseason, white-fleshed peaches, and may, therefore, be thrown out of the list for northern regions. Mamie Ross originated about 1881 with Captain A. J. Ross, Dallas, Texas.

Tree large, vigorous, upright-spreading to somewhat drooping, open-topped, hardy, productive. Leaves 6¾ inches long, 1¾ inches wide, obovate-lanceolate, thick, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-5 small, globose and reniform, reddish-brown glands. Flowers early, 1¾ inches across, pink, single. Fruit early midseason; 2½ inches in diameter, oblong, compressed, usually with sides equal; cavity deep, abrupt, marked with streaks of red; suture variable in depth; apex small, mucronate, set in a slight depression; color pale yellow, with more or less bright red in which are splashes of darker red; pubescence short, fine, thick; skin thin, tough, separates from the pulp; flesh white, streaked with red near the pit, very juicy, stringy, tender, melting, sweet or somewhat sprightly, pleasantly flavored; good in quality; stone semi-cling or cling, long-elliptical, plump, long-pointed, bulged on one side, with pitted and grooved surfaces.

MATTHEWS. *Matthews Beauty.* Matthews is recommended to peach-growers of Maryland, New Jersey, and Delaware as a valuable sort to succeed Elberta. Some growers find that in keeping and shipping characters the fruits are fully equal to those of Elberta. The variety is seldom found in northern or western orchards. Matthews is supposed to be a cross between Elberta and Smock, and originated with J. C. Matthews, Cuthbert, Georgia, some time previous to 1898. The variety is described in nursery catalogs as follows:

Tree vigorous, productive, fruiting annually; fruit late midseason, large, round; skin golden yellow with streaks of red and crimson cheek; flesh yellow, firm, juicy, mild; quality good to very good or better than that of Elberta; stone large, oval, free.

MAYFLOWER. *Early Wonder.* Mayflower has the distinction of ripening its fruit earlier than any other peach. The trees are hardy and productive as far north as Geneva, New York, but the variety is grown in commercial plantations only in the South, being best suited to the southern parts of Georgia and the coastal belt of the Gulf states. It is

said to have originated in North Carolina, but when and by whom does not appear. As grown at Geneva, New York, the tree and fruit characters are as follows:

Tree large, vigorous, upright-spreading, open, hardy, productive; glands small, globose, usually at the base of the leaves. Fruit very early, 2 inches in diameter, round; cavity deep, narrow, abrupt; suture deep; apex rounded, with the tip depressed in the suture; color creamy-white with a dark red blush, mottled and splashed with red; pubescence rather heavy and unsightly; flesh greenish-white, tinged with red at the skin, juicy, tender, subacid; quality fair to good; stone rather large, ovate, conspicuously winged, clinging tenaciously.

MAY LEE. May Lee is a very early white-fleshed, clingstone, pink-cheeked peach introduced to rival Alexander, Triumph, and other early sorts. It fails because the peaches run small, the flesh clings too tenaciously, and the stones crack. The fruit is neither attractive in color nor high in quality. The peaches may be as good in quality as Alexander or Triumph but are no better. May Lee originated with E. W. Kirkpatrick, McKinney, Texas, from a seed of Mamie Ross planted in 1896.

Tree large, spreading, low-growing, very productive. Leaves 6½ inches long, 1¾ inches wide, obovate-lanceolate, thick, leathery; margin crenate; teeth tipped with small reddish glands; petiole ½ inch long, glandless or with 1-5 large, reniform glands. Flowers midseason, 2 inches across, light pink; pedicels very short, of medium thickness, glabrous; calyx-tube greenish-red, campanulate. Fruit early; 2¾ inches in diameter, round, compressed, with unequal halves; cavity deep, narrow, abrupt; suture variable in depth, extending beyond the tip; apex small, mucronate, depressed; color creamy-white, with a blush toward the apex; tomentose; skin thick, tough, semi-free to free; flesh white, very juicy, tender and melting, sweet, mild, pleasantly flavored; good in quality; stone semi-clinging to clinging, oval, conspicuously winged, flattened near the base, with deeply grooved surfaces.

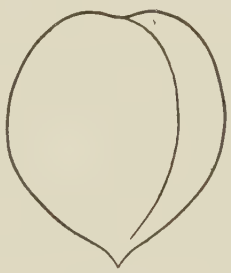
MORRIS WHITE. *White Rareripe.* Morris White is one of the ancients of American peach-orchards, deserving notice now only because of its worthy past. The fruit is distinguished by its flesh, which is white to the pit, with no trace of red on the surface or next to the stone; and by its sweet, rich flavor, which gives it high rank among the best of peaches. The day of Morris White is past for either commercial or home orchards, but it might still be used advantageously in breeding late, white-fleshed, freestone peaches. The origin of the variety is in doubt, but probably it originated in the latter part of the eighteenth century, at Flushing, Long Island.

Tree large, vigorous, upright-spreading, dense-topped, productive. Leaves 6¾ inches long, 1¾ inches wide, flat, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-5 small, globose and reniform glands. Flowers midseason, 1 inch across, pale pink, deepening in color along the edges. Fruit late; 2 inches in diameter, cordate-oval or oblate, compressed, with halves nearly equal; cavity flaring; suture a line, becoming deeper toward the tip; apex roundish, depressed in the suture, with mucronate tip; color pale white, usually without blush; pubescence heavy, long and coarse; skin thin, tough, somewhat adherent; flesh white, juicy, tender and melting, sweet, pleasantly flavored; good in quality; stone nearly free, obovate, flattened near the base, with deeply grooved surfaces.

MOUNTAIN ROSE. Mountain Rose is preëminent among white-fleshed, freestone peaches for fruits of high quality and handsome appearance, which are further distinguished by a distinct and delicious flavor—a sort of scented sweetness. Unfortunately, the variety fails in the chief requirement for popularity in these days of commercial fruit-growing—the trees are unproductive, a fault so marked that Mountain Rose is rapidly passing from cultivation. The crop sells well in all markets where it is known, usually bringing a fancy price because of its extra good quality. The variety originated about 1851 on the farm of a Dr. Marvin, Morristown, New Jersey.

Tree large, vigorous, upright-spreading, low-growing and dense-topped, unproductive. Leaves 6¾ inches long, 1½ inches wide, flattened or curled downward, obovate-lanceolate, thick, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 2-4 small, globose, reddish-brown glands. Blossoms midseason, small, pale pink. Fruit early midseason; 2½ inches in diameter, abrupt, often twig-marked; suture shallow, becoming deeper toward the tip; apex rounded, depressed in the suture, with mucronate or sometimes mamelon tip; color creamy-white, blushed with deep red, with a few splashes of darker red; pubescence long, thick; skin thin, tough, variable in adhesion; flesh white, stained red near the pit, juicy, tender and melting, sweet, mild, pleasantly flavored; good to very good in quality; stone free, ovate, plump, bulged on one side, contracted toward the base, tapering to a short point, usually with small pits in the surfaces.

MUIR. Fig. 173. Muir is suitable only for culinary purposes—attractive enough inside, but so unattractive externally that it could



173. Muir. (×½)

tempt no one who did not know the fruit to be sweet and delicious in flavor. It is a late midseason, yellow-fleshed, freestone peach much used by canners on the Pacific slope. It ought to be more generally grown for the same purpose in the East; for, as a canned product, it is hardly surpassed in appearance or quality. The trees are vigorous, productive, and little subject to leaf-curl, but the fruits are often marred by peach-scab. The variety seems perfectly at home in most peach-regions. In fruit-characters, Muir is very similar to Wager. The variety was found about 1880 on the farm of John Muir, Silveyville, California.

Tree vigorous, upright or somewhat spreading, hardy, productive. Leaves fall early in the season, 6¾ inches long, 1⅜ inches wide, flat or somewhat curled downward, oval-lanceolate, leathery; margin bluntly serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-5 large, reniform glands. Flowers late, 1

inch across, pale pink, darker about the edges, usually single. Fruit midseason; 2¾ inches long, 2½ inches wide, round-cordate or oval, angular, compressed, with unequal halves; cavity shallow, contracted about the sides, flaring; suture medium in depth; apex pointed, with a large, recurved mamelon tip; color lemon-yellow, with little if any blush; pubescence heavy, long; skin thin, tough, separates from the pulp when fully ripe; flesh yellow, faintly tinged near the pit, dry, coarse, tender, sweet, mild; good in quality; stone free, ovate, flattened, wedge-shaped toward the base, tapering to a long apex, with large pits and a few small grooves in the surfaces.

NIAGARA. Fig. 174. *Newark Seedling.* Niagara is a variant of Early Crawford. The fruit ripens later than that of Early Crawford and averages better to the end of the season. But Niagara's great point of merit, as compared with Early Crawford, is that it is more dependable in all tree-characters, being, especially, less capricious as to soil and climate. The peach is beautiful—yellow, with a handsome over-color of red. The flesh, too, is attractive and delectable—yellow, thick, and firm, with a rich, sweet flavor which makes it one of the most palatable peaches of its season. Niagara fails in productiveness in some localities, having in this respect the fault of all its tribe; but it should have a welcome place in any home collection, and, where it proves productive, is one of the best for general market. Niagara probably came from Maryland to Julius Harris, Ridgeway, New York, who introduced it about 1890.

174. Niagara. (×½)

Tree large, upright-spreading, hardy, medium in productiveness. Leaves 6¾ inches long, 1¾ inches wide, flattened or curled downward, oval to obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-5 small, globose, raised, reddish-brown glands. Flowers midseason, 1 inch across, white near the center of the petals changing to dark pink near the edges. Fruit midseason; 2½ inches in diameter, round-cordate, compressed, with equal halves; cavity medium to deep, abrupt, with very tender skin, often splashed with red; suture shallow, deepening toward the apex; apex rounded or pointed, with a mamelon recurved tip; color orange-yellow, blushed with deep, dull red, with stripes and splashes of darker red; pubescence short, thick, fine; skin thick, tough, adherent to the pulp; flesh yellow, deeply tinged with red near the pit, juicy, coarse but tender, sprightly; very good in quality; stone free, broadly ovate, plump, with long point at the apex, usually with grooved surfaces and with few pits, tinged with red.

OLDMIXON CLING. *Oldmixon.* Without question one of the oldest American peaches, going back at least 150 years, Oldmixon Cling is still well worthy of a place in every home orchard. It is a rich, luscious, white-fleshed peach, ripening late; besides being excellent in quality for dessert and culinary purposes, it is uncommonly handsome—a combination of characters possessed by few other peaches. The fruits have but one fault, the pits crack badly. The variety, however, seems to be passing out because the trees are not fruitful, though in all other respects they are seemingly near perfection. Oldmixon Cling is reported to have been introduced by Sir John Oldmixon, an early official of Philadelphia, Pennsylvania, who brought pits to America about 1730.

Tree large, vigorous, upright-spreading, hardy, rather unproductive. Leaves 6¾ inches long, 1½ inches wide, flattened or curled downward, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-4 small, globose glands. Flowers midseason, ¾ inch across, light pink at the center deepening to darker pink at the margins, often in twos, sometimes in threes. Fruit late; about 2½ inches in diameter, round-oval, compressed, with unequal halves; cavity medium to deep, wide; suture shallow, becoming deeper toward the apex; apex round, with a recurved, mamelon tip; color creamy-white, with a blush of lively red and faint splashes of darker red; pubescence fine, short, thick; skin thin, tough, separates from the pulp; flesh white, faintly stained with red near the pit, juicy, stringy, tender, melting, sweet but sprightly, pleasantly flavored; very good in quality; stone clinging, oval, bulged on one side, flattened near the base, plump, long-pointed, with grooved surfaces.

OLDMIXON FREE. Oldmixon Free is a variant of Oldmixon Cling, differing essentially in having a free stone; it is also more sprightly in flavor and not quite so well endowed with the characters that constitute high quality. Outwardly, the two peaches can hardly be told apart. Since Oldmixon Cling is sometimes semi-free and Oldmixon Free often clings more or less, the two are often confused in orchards and markets. Both of these Oldmixons are as hardy in wood and bud as any of the white-fleshed varieties. The blossoms of both appear in late midseason, thereby often escaping frosts. The trees of Oldmixon Free, like those of Oldmixon Cling, have the fault of being unproductive. Oldmixon Free is supposed to be an American seedling of Oldmixon Cling, originating about 1800.

Tree very large, vigorous, upright to spreading, hardy, rather unproductive. Leaves 6⅞ inches long, 1¾ inches wide, curled downward or flattened, obovate-lanceolate, leathery, dull; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-4 small, globose glands. Flowers midseason, ¾ inch across, pale pink near the center becoming darker pink at the outside, often in twos. Fruit late; 2¾ inches in diameter, round-cordate, often compressed, with unequal sides; cavity deep, flaring, tinged with red; suture shallow, becoming deeper toward the apex; apex rounded, with recurved, mamelon tip; color creamy-white overspread with a lively red blush in which are faint splashes and mottlings of darker red; pubescence coarse, thick; skin thin, tough, separates from the pulp; flesh white, deeply tinted with red near the pit, juicy, stringy, tender and melting, sweet, with more or less sprightliness; very good in quality; stone free or nearly free, ovate, bulged, flattened near the base, with grooved and purplish-brown surfaces.

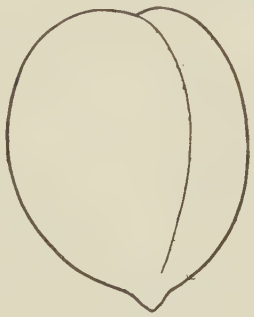
ONDERDONK. Onderdonk was much talked of in Texas and the Southwest as a promising variety in the last years of the century just passed, but it does not seem to have come up to expectations, and is now little heard of, although it is listed in a few of the southern catalogs. It seems hardly to be known in the North outside of experiment station collections. Onderdonk bears the name of its originator, G. Onderdonk, Nursery, Texas. The following brief description is made from trees growing at Geneva, New York.

Tree large, upright spreading, vigorous, rather unproductive in the North; leaves with reniform glands. Fruit midseason, medium to large, round-obiong, flattened; suture distinct ending in a pointed apex; skin lemon-yellow, sometimes with a bit of blush in the sun; flesh yellow, firm, rich with a vinous, piquant flavor, tender, juicy; quality fair to good; pit of medium size, free.

OPULENT. Opulent is a white-fleshed freestone peach of very mediocre character. The fruits are attractive in appearance, but not uncommonly so, and are often marred by peach-scab. The quality is scarcely better than the average, and is ruined for most peach-lovers by a bitter tang, though to others this almond-like bitterness in the flavor may be a commendation. The variety ripens in midseason. The trees are scarcely more satisfactory than the fruits, being unproductive and none too vigorous. Opulent was sent out by Luther Burbank, Santa Rosa, California, as a hybrid between the Muir peach and New White nectarine.

Tree large, vigorous, upright-spreading, with a tendency to droop, medium in productiveness. Leaves 6½ inches long, 1½ inches wide, flattened or curled downward, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-6 small, globose and reniform, reddish-brown glands. Flowers midseason, 1 inch across, white at the center of the petals becoming dark pink near the margins. Fruit early midseason; 2½ inches in diameter, round-oval, compressed, with unequal halves; cavity deep, abrupt, often marked with red; suture a line or very shallow, often a slight depression just beyond the point; apex rounded, with a mucronate and recurved tip; color creamy-white, with a faint blush, speckled and striped with darker red; pubescence short; skin tough, separates from the pulp; flesh white, juicy, stringy, tender, melting, sweet but sprightly; fair in quality; stone free, ovate, flattened at the base, plump, short-pointed, with pitted surfaces marked by few grooves.

PALLAS. Fig. 175. *Pallas Honeydew.* Pallas is one of the best of the several honey-flavored, beaked peaches. It is supposed to thrive only in warm climates, but in New York the trees are vigorous, appear to be hardy, and differ from northern varieties, so far as life events are concerned, only in holding their leaves longer. The fruits run small and lack uniformity in size, faults that will not permit Pallas ever to become a commercial sort in northern regions. Moreover, the peaches are not attractive in appearance, suffer terribly from brown-rot, and do not ship well. In quality Pallas is almost unapproachable—so rich, sweet, aromatic, and delicious as well to justify the sobriquet, "Honeydew," bestowed upon it. This variety might well be planted in home orchards in the North, and is a standard in the far South. Pallas is one of the many seedlings of Honey and originated in 1878 with L. E. Berckmans, Augusta, Georgia.



175. Pallas. (×½)

Tree medium in vigor, upright-spreading, round-topped, productive. Leaves fall late in the season, 6 inches long, 1½ inches wide, ovate-lanceolate, thin, leathery; margin sharply and often doubly serrate, glandular; petiole ½ inch long, stout, glandless or with 1-3 small, globose glands. Flowers midseason, light pink changing to dark red. Fruit early midseason; 2 inches in diameter, pointed-oval, compressed, with halves equal; cavity shallow, flaring, with tender skin; suture shallow; apex a characteristically long, straight beak; color pale white, occasionally with a bright red blush but mostly with dull mottlings; pubescence medium in amount; skin thick, tough; flesh white, scarcely stained at the pit, very juicy, sweet, tender and melting, high-flavored; very good in quality; stone free, ovate, slightly wedge-shaped at the base, plump, conspicuously winged, long-pointed, with pitted and grooved surfaces.

PEARSON. Pearson is a large, handsomely-colored, white-fleshed, freestone peach of good quality, which ripens ten days before Champion. There are a good many white-fleshed peaches at this season, but Pearson is an exceptionally good one, much excelling Mamie Ross, with which it might have to compete, although the latter ripens a little later. The trees are very vigorous, productive, and healthy. Pearson originated with J. M. Pearson, McKinney, Texas.

Tree large, vigorous, spreading, the lower branches drooping, very productive. Leaves 7 inches long, 1¾ inches wide, obovate-lanceolate, leathery; apex long and narrow; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-4 small, globose, reddish-brown glands. Flowers very early, 2 inches across, pink, usually single. Fruit early midseason; round-oval or somewhat cordate, compressed, with unequal halves, bulged near the apex; 2 inches in diameter; cavity medium to deep, abrupt, with tender skin; suture quite variable in depth; apex round or depressed, with a small, recurved, mamelon tip; color greenish-white, with a blush covering much of the surface, more or less mottled; pubescence thin, fine, short; skin thin, tough, semi-free; flesh white, faintly tinged with red near the pit, juicy, stringy, tender and melting, pleasantly flavored; good in quality; stone semi-clinging or free, oval, flattened at the base, winged, with pitted surfaces.

PEENTO. *Chinese Flat. Flat Peach of China.* Peento was the first variety of a group of peaches to which it gives its name, now common in the Gulf regions. The peach is flattened endwise, with a flat stone, so different

from the fruits of other members of Prunus as to make this about the most unique of all drupe-fruits. Besides being remarkable for shape, the fruits are distinguished by a rich, sweet flavor with a savor of the almond. Without doubt, Peento is a descendant of the flat peaches of China, but the original tree came from Java to England, whence it was imported to America in 1828 by William Prince. The variety is a parent of a score of more worthy offspring, few of which are flat, however.

Tree vigorous, open-topped, tender in the North, productive. Leaves mature late, 1½ inches long, 1 1/10 inches wide, oblong-oval, thin, leathery; margin coarsely serrate; teeth tipped with dark glands; petiole with 2 or 3 reniform glands of medium size, gray or greenish-yellow. Fruit early; 1½ inches thick, 2½ inches wide, strongly oblate; cavity shallow, very wide, flaring; suture deep, wide, extending two-thirds around the fruit; apex depressed, set in a large, wide, flaring basin; color creamy-yellow, mottled and delicately pencilled with red, often blushed toward the apex; pubescence short, thick; skin thick, tough, nearly free; flesh white, stained red at the stone, juicy, stringy, tender and melting, sweet, mild, with an almond-like flavor; very good in quality; stone clings, red, strongly oblate, with corrugated surfaces; ventral suture very deep at the edges, narrow at the base, becoming wide at the apex; dorsal suture a wide, deep groove, merging into a line at the apex.

PHILLIPS CLING. Phillips Cling has the reputation of being the most popular yellow-fleshed clingstone grown in California for the great canning industry of that state. The fruits ripen progressively, so that picking covers from two to three weeks, and hang on the trees well even after fully mature. Their firmness enables them to be delivered to the cannery without bruising. Canners like the product because the peaches are of even size, of the same color from skin to stone, have a small pit, and the flesh is exceedingly rich in flavor and very highly colored. The trees are very large, vigorous, and heavy producers, but require rich land and an abundance of moisture. The variety originated with Joseph Phillips, Sutter County, California, sometime previous to 1889, when it was first described.

Tree very large, upright, vigorous, healthy, very productive. Fruits 3 inches in diameter, round-oblong; cavity deep, wide, abrupt; apex rounded, usually with an erect tip; skin golden-yellow with faint stripes of red and blushed on the sunny side; pubescence short, fine; skin thin, tender, adherent; flesh yellow, juicy, fine-grained, firm, sweet and rich; quality fair to good; stone bulged at apex, flattened at the base, ovate, rather large, clinging tenaciously.

PROLIFIC. *New Prolific.* Prolific was heralded a quarter-century ago as a great acquisition to the peach-flora of the country, but it is doubtful if it is as popular now as it was a few years after its introduction. The trees are satisfactory, excelling most of their orchard associates in vigor, size, health, hardiness, and productiveness; but the peaches fall below the mark in several characters. The fruits are of but medium size, not uncommonly attractive in color, and too poor in quality to rate high among the peaches of its season, which is a few days before Elberta. The flesh is yellow, firm, dry, and little attacked by rot. With the qualities just named, the fruits ship well and might be in demand in the markets for culinary purposes. Prolific was introduced about 1890 by Greening Brothers, Monroe, Michigan, under the name New Prolific.

Tree large, vigorous, spreading, becoming drooping, open-topped, very productive. Leaves 6½ inches long, 1½ inches wide, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with from 1-5 small, globose glands. Flowers early, 1½ inches across, white near the center becoming pink along the edges. Fruit mid-season; 2½ inches wide, round-oval, bulged on one side, compressed, with unequal halves; cavity deep, usually abrupt, frequently mottled with red; suture a line, becoming deeper toward the tip; apex round or somewhat pointed, with a recurved, mamelon tip; color light orange, mottled and blushed with red; pubescence thick, fine; skin thin, tough, separates from the pulp; flesh light yellow, stained with red near the pit, medium juicy, coarse, stringy, tender, sweet, mild, pleasantly flavored; good in quality; stone free, ovate, bulged on one side, plump, with long, pointed apex, with surfaces grooved and marked by small pits.

RAY. This is another of the many early, white-fleshed, freestone peaches which are competing for favor among peach-growers. Several faults condemn it; worst of all, the trees are not productive. Add to unproductiveness, lack of uniformity in size, shape, color and flavor of fruit, and the variety is out of the race as a commercial sort. Nevertheless, Ray is well spoken of in several states. The variety originated with D. Ray, Tyler, Texas, about 1890.

Tree large, vigorous, upright-spreading, the lower branches drooping, medium in productiveness. Leaves 6½ inches long, 1½ inches wide, flattened or curled downward, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-3 small, globose glands. Flowers midseason, 1 inch across, light pink becoming darker pink along the edges; pedicels short. Fruit midseason; 2½ inches in diameter, round-conic, compressed, with nearly equal halves; cavity narrow, abrupt, with tender skin; suture shallow, deepening toward and often extending beyond the tip; apex round, with a mucronate tip; color greenish-white with a bright pinkish-red blush, faintly mottled; pubescence coarse, thick, long; skin very thin, tough, separates from the pulp; flesh greenish-white, stained with red near the pit, juicy, stringy, firm but tender, aromatic, sprightly; good in quality; stone semi-free to free, ovate, plump, with short point at the apex, with grooved and pitted surfaces.

RED BIRD CLING. Some growers say that Red Bird Cling and Early Wheeler are identical, but the two varieties received from reliable nurserymen seem to be distinct on the grounds of the New York Agricultural Experiment Station. The variety has been on probation in peach-growing sections of the United States for some fifteen or twenty years, but so far finds favor only in the southwestern part of the country, where, on account of its bright red color, earliness, and fair shipping qualities, it proves to be a fairly good commercial sort. The tree is hardy, healthy, and holds its foliage very late. The variety was introduced by Stark Brothers, Louisiana, Missouri, about 1900.

Tree large, vigorous, upright-spreading, open, moderately productive; glands globose, variable in color. Flowers midseason, large, 1¾ inches across, pink. Fruit very early, 2½ inches in diameter, round-oval, irregular, more or less bulged at the apex; cavity very deep,

narrow, abrupt; suture shallow on the sides but deep at the cavity; apex often large and recurved, depressed; color pale creamy-white, covered with lively red, often mottled with deeper red; pubescence short and fine; flesh white, red at the pit, juicy, tender, sweet; fair to good; stone oval, plump, long-pointed, clinging tenaciously.

RED CHEEK MELOCOTON. *Red Cheek. Malacatune.* For nearly a century, beginning soon after the Revolutionary War, Red Cheek Melocoton had few rivals among yellow-fleshed, freestone peaches. Even yet it is surpassed in quality only by members of the Crawford family, of which it is supposed to be the immediate ancestor. Lack of vigor and unproductiveness have driven Red Cheek Melocoton from common cultivation—indeed it is now almost impossible to obtain the trees. It is an American seedling which sprang from a bud of a stock on which Lemon Cling had been grafted, at Flushing, New York, about 1800.

Tree medium in size, vigorous, upright-spreading, lacking in productiveness. Leaves 7¼ inches long, 2 inches wide, obovate-lanceolate, leathery; margin sharply serrate; petiole ½ inch long, glandless or with 1-3 small, globose, alternate glands. Blossoms midseason, small. Fruit midseason; 2½ inches in diameter, round-cordate, compressed, with halves nearly equal; cavity wide, deep, abrupt; suture shallow; apex rounded, with mamelon tip; color deep golden-yellow, splashed, blushed and mottled with red; pubescence heavy; skin thick, tough, adherent to the pulp; flesh rayed with red near the pit, yellow, juicy, firm but tender, sweet, pleasantly flavored; good in quality; stone free, ovate, more or less bulged at one side and drawn out near the base, plump, rather long-pointed, with short grooves and pits in the surfaces.

REEVES. Fig. 176. *Reeves' Favorite.* Reeves is an old favorite now rapidly passing out of cultivation. In its day, it was justly celebrated for the high quality of its yellow-

176. Reeves. (×½)

fleshed, freestone fruits, which are as handsome as they are palatable. The peaches have two minor defects to keep them from perfection: they are too irregular in shape, and sometimes fall short in size. In texture of flesh, juiciness, taste, and aroma they are scarcely surpassed. The fault that condemns the variety is unproductiveness in the trees. To make up in some degree for unfruitfulness, the trees are vigorous and more than usually hardy. Reeves is worthy of perpetuation for home orchards. This attractive peach came from a chance seedling found about 1840 by Samuel Reeves, Salem, New Jersey.

Tree medium to large, vigorous, upright-spreading, hardy, unproductive. Leaves 6¾ inches long, 1¾ inches wide, obovate-lanceolate; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-3 small, globose glands. Flowers late, 1 inch across, light and dark pink. Fruit midseason; 2½ inches in diameter, round-cordate, compressed, with unequal halves; cavity often very deep, abrupt, the skin tender and often marked with red; suture shallow, sometimes extending beyond both cavity and tip; color deep yellow, blushed with dull red, striped, splashed and mottled with brighter red; pubescence thick, long; skin thick, tough, separates from the pulp; flesh yellow, tinged with red near the pit, juicy, stringy, tender and melting, pleasantly flavored, mild, sweet; very good in quality; stone free, oval, more or less bulged near the apex, sometimes winged along the ventral suture, with pitted surfaces.

RIVERS. *Early Rivers.* Earliness and high quality of fruit keep Rivers alive in private places in America. No one would think of planting it in a commercial orchard because of its small fruits, which have tender skin and flesh showing every bruise, and its susceptibility to brown-rot. The peach is a white-fleshed freestone, tender, juicy, with an exceedingly rich, sugary flavor with a savory smack of the nectarine; it is remarkable for beauty of flesh, which is white to the stone, translucent, and more or less mottled and interspersed with white veins. At their best, the fruits are rather large and quite handsome as they grow in America, but even so they are but a shadow of the peach described under this name in European fruit-books. The trees are fairly satisfactory in all essential characters. Rivers originated with Thomas Rivers, Sawbridgeworth, England, about 1865.

Tree large, vigorous, upright-spreading, with inclination to droop, round-topped, hardy, productive. Leaves 5¾ inches long, 1½ inches wide, recurved, obovate-lanceolate, thin, leathery; margin finely serrate; teeth tipped with fine, reddish-brown glands; petiole ¼ inch long, with 1-6 reniform, greenish-yellow glands. Flowers early, pink, 1½ inches across, often in pairs. Fruit early, 2½ inches in diameter, round-oval, compressed; cavity shallow, contracted, irregular, abrupt; suture medium to shallow; apex rounded, mucronate; color creamy-white blushed with red; pubescence short, heavy; skin thick but tender, adherent to the pulp; flesh white, translucent, veined, juicy, melting, sweet or mildly sprightly; good in quality; stone nearly free, oval, plump, bulged on one side, light-colored, short-pointed at the apex, with grooved surfaces.

177. Rochester. (×½)

ROCHESTER. Fig. 177. Fruit-growers have long desired an early, yellow, freestone peach. There are several competitors for the

place, the latest of which is Rochester, a member of the Crawford group, and in several respects a marked improvement on the well-known Early Crawford. Rochester precedes Early Crawford by several days, ripening soon after the middle of August. It has an unusually long season, which under some circumstances may be an asset, under others a liability. The peaches are large, yellow, with a handsome over-color of mottled red, more rotund than either of the two Crawfords,—qualities which make a strikingly beautiful peach; the flesh is thick and firm, marbled yellow, stained with red at the pit, juicy, rich, sweet. Rochester seems to be sufficiently productive for a good commercial fruit, but it remains to be seen how generally it is adapted to soils and climates. The variety came from a seed planted about 1900 on a farm owned by a Mr. Wallen, Rochester, New York.

Tree large, vigorous, upright-spreading, more upright than Elberta, productive. Leaves 6 inches long, 1½ inches wide, ovate-lanceolate, thin, leathery; margin shallowly crenate; petiole ½ inch long, thick, with 2-8 large, reniform glands. Flowers midseason, pale pink, 1 inch across. Fruit early midseason; 3-3½ inches in diameter, round-oblate, compressed, often bulged near the apex; cavity wide, deep, flaring; suture shallow, becoming deeper near the tip; apex variable, with a mucronate tip; color orange-yellow, blushed with deep, dark red, mottled; pubescence heavy; skin thick, tough, separates from the pulp; flesh yellow, stained with red near the pit, very juicy, tender and melting, sweet, highly flavored, sprightly; very good in quality; stone free, oval, plump, flattened near the base, with roughened surface marked by large, deep pits and short grooves.

RUNYON ORANGE CLING. This is an old variety at one time much grown in California, still esteemed and rather extensively planted in the Sacramento region, where some growers prefer it to the older Orange Cling. The variety seems never to have been grown in commercial orchards in the East. It originated with Sol Runyon on the Sacramento River some time previous to 1889 when it was first described in Wickson's *California Fruits*.

Trees vigorous, healthy, productive and not subject to mildew as are those of Orange Cling. Fruit midseason, very large, yellow, with a dark crimson cheek; flesh firm, rich, sugary, with a vinous flavor; stone small, clinging.

ST. JOHN. *Yellow St. John. Crane.* Unproductiveness and uncertainty in bearing keep this magnificent yellow-fleshed dessert fruit from being one of the most popular early peaches. Even with these handicaps, to which in many situations may be added small fruits, St. John has maintained great popularity for home orchards. The peach is one of the earliest of the Crawford group, a perfect freestone, handsome in appearance, sweet, rich, and delicious in flavor. The fruits resemble those of Early Crawford in size and shape, but are a little more rotund, somewhat smaller, not quite so high in quality, and ripen several days earlier. The trees are all that could be asked in size, vigor, and hardiness. The place and time of origin of St. John are unknown; it is more than a century old, came from the South, and has been widely planted in southern peach districts.

Tree medium to large, vigorous, upright-spreading, unproductive. Leaves 6½ inches long, 1¾ inches wide, obovate-lanceolate, thick; margin finely serrate, often in two series; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-5 small, globose glands. Blossoms midseason, 1 inch across, white toward the base of the petals, dark pink near the edges. Fruit early; 2¾ inches in diameter, round-oval, often bulged near the apex, usually compressed, with oblique sides; cavity medium to deep, wide, abrupt or flaring, often tinged with red; suture deep near the tip; apex round or depressed, with a pointed tip; color deep yellow, blushed and splashed with carmine; pubescence thick and long; skin thick, tough; flesh light yellow, tinged with red near the pit, juicy, tender, pleasantly sprightly, highly flavored; very good in quality; stone free, ovate, plump, tapering to a long point, with rough surfaces marked by large and small pits.

SALWEY. *Salway.* Salwey is a yellow-fleshed, freestone peach of attractive appearance and good quality, neither handsome enough nor good enough in quality, however, to be considered a first-class dessert fruit. On the other hand, it is one of the best sorts for canning, preserving, and evaporating. The trees are vigorous, hardy, healthy, and very productive, but, unfortunately, their crop is so late in northern peach regions that the variety cannot be depended upon. Possibly no other peach is more widely grown than Salwey. It is a standard sort in France, England, and in peach regions in America from the Atlantic to the Pacific and from Canada to the Gulf. This uncommon adaptability to diverse soils and climates ought to make it a valuable sort in peach-breeding. Salwey was raised in 1844 by Colonel Salwey, Egham Park, Surrey, England, from the seed of an Italian peach.

Tree of medium size, vigorous, upright-spreading, becoming drooping, dense-topped, very productive. Leaves 7 inches long, 1¾ inches wide, ovate-lanceolate, leathery; apex acuminate; upper surface dark, dull green, smooth, becoming rugose near the midrib; margin finely serrate; teeth tipped with reddish-brown glands; petiole glandless or with 1-6 small, globose and reniform glands, ½ inch long. Flowers midseason, 1 inch across, white at the center of the petals, becoming pink near the margins. Fruit very late; 2½ inches in diameter, round-cordate, bulged near the apex, compressed; cavity deep, abrupt, often splashed with red; suture shallow, often extending beyond the tip; apex usually a small, elongated point; color greenish-yellow, usually with a brownish-red blush, splashed with dark red; pubescence short, thick, fine; skin thin, tough, adherent to the pulp; flesh golden-yellow, faintly tinged with red near the pit, juicy, stringy, tender, becomes dry with age, sweet, pleasantly flavored, aromatic; very good in quality; stone free, oval, very plump, pointed at the base, with large pits and short grooves in the surfaces.

SCHUMAKER. *Shoemaker's Seedling.* Schumaker, now grown only in western New York and Pennsylvania, for a long time was described as the earliest of the white-fleshed, clingstone peaches. There are other peaches as early, but this is the best flavored of them all. Moreover, when fully ripe it is almost a freestone. It is a handsome peach in color and shape, but the fruits are too small,—a fault that can be remedied in part by thinning. The trees are large, hardy, vigorous, and productive to a fault. With all these good qualities, the wonder is that Schumaker is not more

popular as a commercial variety to open the season, but for some reason peach-growers are not pleased with it—probably because of the small size of the peaches. For a peach of its season, Schumaker is remarkably free from brown-rot. This variety originated as a seedling with Michael Schumaker, Fairview, Pennsylvania, about 1870.

Tree large, vigorous, upright-spreading, becoming drooping, open-topped, productive. Leaves 6½ inches long, 1½ inches wide, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-4 small, globose, reddish-brown glands. Flowers early; 1½ inches across, pink. Fruit very early; 2 inches in diameter, round, compressed, with unequal halves; cavity deep, flaring; suture shallow; apex ending in a recurved tip; color creamy-white, heavily blushed and often mottled with red; pubescence short, thick; skin thin, tender, separates from the pulp when fully ripe; flesh white, very juicy, stringy, tender, sweet, aromatic, highly flavored; very good in quality; stone clinging, becoming semi-cling, oval, plump, inconspicuously winged, with corrugated surfaces.

SELLERS CLING. *Sellers Orange Cling.* Canners in California recommend Sellers Cling as one of the best midsummer varieties for their trade. The variety finds favor with the growers because of the great productiveness of the trees. Although the product does not sell for so high a price as that of two or three other yellow-fleshed clingstones, the greater productiveness of the trees makes up for the difference in price. The peaches are handsome in color, uniform in size, and ripen at a favorable period of the canning season. The variety originated on the ranch of S. A. Sellers, Contra Costa County, California, some time previous to 1889.

Tree large, very vigorous, upright-spreading, one of the most productive of all peaches in California. Flowers small, pink with darker pink about the edges, appearing in midseason. Fruit late, very large, round-oblong, somewhat flattened; suture distinct; apex rounded with well-marked tip; skin rich golden, sometimes with a faint tinge of red; flesh deep golden from skin to stone, very firm, moderately juicy, sweet and rich; quality good to very good; pit of medium size, plump at the point, flattened at the base, clinging tenaciously.

SMOCK. *Smock Freestone.* Though little grown now, during the last half of the last century Smock was one of the leading commercial peaches of its season. The variety has so little to recommend it, however, that one must believe that reputation more than merit kept up its popularity. The trees are about all that could be desired, but the peaches are of but mediocre quality and not attractive in appearance, lacking in size and color, ungainly in shape, and having but little uniformity in size, color, or shape. It is one of the latest yellow-fleshed peaches, and is said to be excellent for culinary purposes. With so many better varieties of late yellow-fleshed, freestone peaches, Smock is hardly worth planting. It originated three-quarters of a century or more ago with a Mr. Smock, Middletown, New Jersey.

Tree large, vigorous, upright-spreading, somewhat drooping, dense-topped, tall, usually very productive. Leaves 6¼ inches long, 1½ inches wide, flattened or curved downward, obovate-lanceolate, thick; margin finely serrate; teeth tipped with dark red glands; petiole ½ inch long, with 1-5 small, globose or reniform glands. Flowers midseason, 1 inch across, white at the center of the petals, light or dark pink near the edges, often in twos. Fruit very late; 2½ inches in diameter, oval, irregular, compressed, with halves unequal and somewhat angular; cavity narrow, abrupt, contracted around the sides; suture a line, becoming deeper toward the apex; apex rounded, with a recurved, mucronate tip; color greenish-yellow or sometimes orange-yellow, specked and mottled with dull, dark red or sometimes faintly tinted with a bronze blush; pubescence very heavy, thick, fine; skin thin, tough, adherent to the pulp; flesh yellow, faintly tinged with red near the pit, tender, sprightly, pleasantly flavored; good in quality; stone free, obovate, bulged near the apex, flattened toward the base, with deeply grooved surfaces.

SNEED. *Peebles. Bowers.* Sneed was at one time more or less grown in all the peach regions of the United States as an early commercial variety, but it has been very generally discarded except in California and the southern Atlantic states. In northern peach-growing regions, the fruits run too small and are rather too poor in quality, although it is probably as well flavored as any other of the extra early peaches. Southern growers find it a fairly good early market sort, but surpassed by several others of its class. The variety originated about 1885 with Judge J. L. T. Sneed, Nashville, Tennessee.

Tree of medium size, rather weak in growth and but moderately productive; glands small, globose, red. Flowers midseason, small, pink. Fruit very early, of medium size, 2¼ inches in diameter, round-oval, slightly compressed; cavity medium in depth and width, abrupt; suture distinct; apex depressed, with a distinct tip; color greenish-white, blushed and speckled with dark red; pubescence rather short but thick; skin thin, tender, parting from the flesh; flesh greenish-white, juicy, a little stringy, tender, melting, with a mild subacid, pleasant flavor; quality good to very good; stone large, clinging, oval, pointed.

STEVENS. Fig. 178. *Stevens Rareripe.* Stevens is a large, white and red, white-fleshed, freestone peach. The variety is best known as Stevens Rareripe, but the last part of the name is inapt, for the true rareripes are early

178. Stevens. (×½)

ripening peaches, while with Stevens lateness is one of its prime assets. In quality, the fruits are extra good, the flesh-characters pleasing in every respect. The flavor is a pleasant mingling of sweet and sour not found in many other peaches so late in the season. The appearance is as alluring as the taste, the fruits

being almost perfect in color and shape. These late, white-fleshed peaches now seldom sell well, since they usually reach the markets in poor condition, but they are choice fruits for home use, and for this purpose Stevens should be planted in every home orchard. The variety has the reputation of being hardy in both wood and buds. Stevens originated about 1858 on the farm of B. Stevens, Morristown, New Jersey.

Tree vigorous, upright-spreading, with the lower branches inclined to droop, productive. Leaves 6 inches long, 1½ inches wide, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-6 small, reniform glands. Flowers midseason, small, pale pink. Fruit late; 2¾ inches in diameter, round-oval, with nearly equal sides; cavity deep, wide, abrupt; suture deep, often extending beyond the tip; apex rounded, with a strongly mucronate and recurved tip; color greenish-white overlaid with purplish-red, often mottled or splashed with darker red; pubescence short, fine; skin thick, tough, adherent to the pulp; flesh white, tinted with red near the pit and red underneath the deepest surface blush, juicy, coarse, sweet, sprightly; good in quality; stone nearly free, obovate, flattened at the base, plump, with grooved surfaces.

STINSON. *Stinson October.* This is an old sort long since discarded in most peach-growing regions, but still to be found in peach orchards in the south Atlantic states. Some growers maintain that it is one of the most profitable late white-fleshed clingstones in the South for local markets. The fruits are a little too soft for distant shipment. The variety was first mentioned in the American Pomological Society report in 1881, but where, when, and by whom it was originated does not appear. The following description of the fruit is compiled:

Fruit very late, large, broadly oval; color creamy-white, shaded with dark purplish-red on the sunny side; flesh white, veined with red and quite red at the pit, melting, very juicy, mildly subacid; quality good to very good; stone rather large, ovate, sharp-pointed, clinging tenaciously.

STRAWBERRY. *Rose.* Strawberry is an old eastern sort long since discarded everywhere in the United States except in California, where it is still grown somewhat in home orchards as an early white-fleshed variety. Perhaps the quality that best recommends it is the rich, sweet, distinctive flavor of the fruit. The variety was introduced by Thomas Hancock, Burlington, New Jersey, some time previous to 1841, when it was first described in Kenrick's *New American Orchard.* The following description is compiled:

Fruit early, of medium size, round-oval; skin pale yellow, marbled with dark red; flesh white, juicy, melting, rich with a sprightly, vinous, distinctive flavor; pit oval, pointed, clinging.

STUMP. *Stump the World. Late Stump.* Stump has long been a favorite white-fleshed, freestone, late peach of the Oldmixon type. The peach is not a handsome fruit, but makes up in quality what it lacks in looks. The flesh is melting, juicy, sparkling, rich and good, though dry and very mediocre when over-ripe. The peaches are too tender for distant shipment, and the variety is of value only for local markets and home use. The trees are large, vigorous, hardy, healthy, and productive, with a shapely, upright-spreading, dense-topped head,—about all that could be desired in a peach-tree. In spite of the high quality of the peaches and the excellent tree-characters, Stump is steadily waning in popularity and will, no doubt, soon pass from cultivation. The variety originated in New Jersey nearly a century ago.

Tree of medium size, vigorous, upright-spreading, dense-topped, productive. Leaves 6¾ inches long, 1¾ inches wide, folded downward, broad-oval, leathery; margin finely serrate, often in two series; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-4 globose glands. Flowers midseason, 1 inch across, white at the center, becoming pink near the margin. Fruit late; 2½ inches in diameter, round-oval, compressed, with markedly unequal halves; cavity shallow, often extending beyond the tip; apex round or pointed, with a recurved, mucronate tip; color creamy-white, blushed, mottled and splashed with red; pubescence long, thick, coarse; skin thin, tough, separates from the pulp; flesh white, strongly stained with red near the pit, juicy, tender and melting, sweet, rich, pleasantly flavored, aromatic; very good in quality; stone nearly free, oval, plump, flattened toward the base, tapering to a long point, with grooved surfaces.

SUMMER SNOW. Summer Snow is a curiosity with some value for culinary purposes. Its distinctive peculiarities are fruits almost pure white with flesh white as snow from skin to pit. The quality of the peach is poor, and the flesh clings to the pit so tenaciously that the fruits have no value whatsoever for dessert, but are said to be excellent for pickling and to make a very good and a very distinctive canned product. There are no records of the origin of this peach, but it is doubtful whether it dates back more than a quarter of a century.

Tree large, vigorous, upright-spreading, slightly drooping, productive. Leaves 6¼ inches long, 1½ inches wide, obovate-lanceolate, thin; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-6 small, globose and reniform glands. Flowers midseason, 1½ inches across, white, sometimes in twos. Fruit late; 2½ inches in diameter, round-cordate, somewhat angular, compressed, with unequal sides; cavity deep, narrow, abrupt, contracted about the sides, twig-marked; suture shallow, becoming deeper toward the tip; color greenish-white changing to creamy-white, without blush; pubescence long, thick, coarse; skin thin, tender, adherent to the pulp; flesh white to the pit, juicy, meaty, mildly sweet to sprightly; fair in quality; stone firmly clinging, broad-oval, often bulged near the apex, winged, with pitted surfaces marked with short grooves.

SUSQUEHANNA. This old variety, a favorite in the East a generation ago, is now discarded in eastern regions, but is still rather commonly grown in California. Occasionally, also, it is to be found in southern orchards. Susquehanna originated with a Mr. Griffith on the banks of the Susquehanna River, Pennsylvania, the exact place and time unknown, some time previous to 1856, when it was first described in the report of the American Pomological Society.

Tree large, upright, vigorous, very productive; leaves large and luxuriant, with large, reniform glands. Fruit midseason, very large, nearly round; suture distinct; skin rich yellow with a beautiful red cheek; flesh

yellow, sweet, juicy, with a rich vinous flavor; quality good to very good; stone medium size, plump, long-pointed at the apex, perfectly free from the flesh.

THURBER. Thurber is mediocre in all of its characters in the North, though perhaps the fruit is a little better in quality than the average white-fleshed, midseason freestone. In the South, however, the variety seems to be considered one of the best of its class, not only in quality, but also in size and appearance of fruit. The fruits are small in the North, while all descriptions of them in the South say they are large. The variety is worth planting in home orchards. Thurber is a seedling of Chinese Cling grown by L. E. Berckmans, Rome, Georgia, about 1870.

Tree above medium size, vigorous, upright-spreading, productive. Leaves 6 inches long, 1½ inches wide, flattened or curled downward, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-4 small, globose glands. Flowers midseason, 1 inch across, light pink, darker along the edges, usually single. Fruit midseason; 2½ inches in diameter, round-oval, somewhat compressed, with unequal halves; cavity shallow, narrow, flaring or abrupt; suture a line or very shallow; apex round, with a recurved, mamelon tip; color creamy-white, with splashes of dull red over a lively red blush; pubescence long, coarse, thick; skin thin, tough, variable in adherence to the pulp; flesh white, deeply stained with red near the pit, juicy, tender and melting, pleasantly sprightly, aromatic; good in quality; stone free, oval, flattened toward the base, plump, tapering to a short point, often winged on the ventral suture, with surfaces pitted and marked by short grooves.

TRIANA. Triana is another of the honey-fleshed, beaked peaches, at home only in the far South. It can be grown, however, with about as much certainty as many other varieties in the North. Small size and poor shipping qualities in the fruits debar it from competing with commercial peaches in the North, but it is well worth planting in home orchards for the sake of variety, and because of its delicious flavor, a sort of scented sweetness wholly unknown in northern varieties. Triana originated about 1888 at the Glen Saint Mary Nurseries, Glen Saint Mary, Florida.

Tree of medium size, upright-spreading, open-topped, productive. Leaves 5½ inches long, 1½ inches wide, slightly lanceolate, thin, leathery; margin finely serrate; petiole ½ inch long, with 1-5 small, reniform glands. Blossoms 1½ inches across, pale red, in dense clusters, usually single. Fruit late midseason; 2 inches in diameter, oval, compressed, with unequal halves; cavity shallow, flaring; suture of medium depth; apex a long, mucronate tip; color creamy-white, blushed, splashed and mottled with bright red; pubescence short, fine; skin thin, tender, adhering to the pulp; flesh white, faintly stained with red near the pit, tender, sweet, mild; good in quality; stone nearly free, elliptical, usually with pitted surfaces.

TRIUMPH. Triumph is an extra early, yellow-fleshed peach so inferior in appearance and quality of fruit, and so subject to brown-rot, that it is not worth growing in any but the most northern peach regions, where, because of great hardiness in wood and bud, it becomes a valuable variety. It is grown more or less, however, North and South, because it is one of the earliest yellow-fleshed sorts, and because the trees bear regularly and abundantly. The dark color and fuzzy pubescence detract materially from the appearance of the peach. Small pits somewhat offset the small size of the fruits. The peaches, if not attacked by brown-rot, stand shipment well. Though often put down as a clingstone, the peach is a semi-cling, and sometimes the stone is free. Triumph is one of several seedlings grown by J. D. Husted, Vineyard, Georgia, about 1895.

Tree of medium size, vigorous, upright-spreading, with lower branches drooping, hardy, very productive. Leaves 6 inches long, 1½ inches wide, obovate-lanceolate, thin, leathery; margin finely and shallowly serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-4 very small, globose glands. Flowers early, 1½ inches across, dark pink, sometimes in twos. Fruit early; 2 inches in diameter, round-oval, compressed, with unequal sides; cavity deep, abrupt, with tender skin; suture shallow; apex rounded, with a mamelon and recurved tip; color pale yellow overlaid with dark red; pubescence thick and long; skin thin, adherent to the pulp;; flesh yellow, stained with red near the pit, juicy, firm, sprightly; fair in quality; stone semi-free to free, obovate, flattened, wedge-like at the base, bulged at one side near the apex, plump, with deeply grooved surfaces.

TROTH. *Troth's Early Rareripe. Troth's Early.* Troth, the standard early peach in the middle of the last century, is now all but out of cultivation. It is still listed in a few nursery catalogs, and is still on the fruit-list of the American Pomological Society. Among the multitude of early peaches now grown, Troth cuts but a sorry figure in either tree- or fruit-characters. The variety originated in the first years of the nineteenth century, probably in New Jersey.

Tree medium in size, vigorous, upright-spreading, very productive. Leaves 6¼ inches long, 1¾ inches wide, obovate-lanceolate, leathery, dark, dull green, smooth becoming rugose near the midrib; margin finely and shallowly serrate; teeth tipped with reddish-brown glands. Blossoms small, midseason. Fruit early midseason; 2 inches in diameter, round-oblate, compressed, with halves unequal; cavity abrupt, irregular, often dotted and striped with red; suture shallow, extending beyond the point; apex depressed, with a mucronate tip; color creamy-white, blushed with dark, dull red and with more or less heavy mottlings extending over more than half of the surface; pubescence thick, short; skin thin, tender, adheres to the pulp; flesh white, tinged with red near the pit, tender, melting, pleasantly flavored; fair to good in quality; stone free, oval, flattened toward the base, acute at the apex, with grooved surfaces.

TUSKENA. *Tuscan Cling.* By common consent, Tuskena is one of the best early clingstone varieties for canning and shipping in California, where it is usually known as Tuscan Cling. In the markets, the peaches are always in great demand, and canners pay the highest price for them. The trees are exceptionally vigorous and produce heavily. The variety is particularly adapted to the foothill sections of California. While Tuskena originated in the East many years ago, it is not now to be found elsewhere than in the Pacific states. The variety originated in Mississippi sometime previous to 1873; was placed on the fruit list of the American Pomological Society in that year, but was dropped in 1875, but was replaced in 1899.

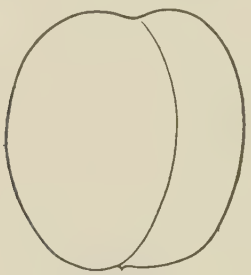
Tree large, open, vigorous, healthy, productive. Fruit early, large, round-oval; suture distinct; apex round,

depressed; cavity deep, abrupt; skin yellow with a dark red cheek; flesh yellow, red at the pit, firm, sweet but vinous, rich; quality very good to best; stone large, clinging.

VICTOR. *Early Victor.* This variety is occasionally to be found in northern orchards, but its culture is confined almost wholly to Texas, where, because of its very early season, it is esteemed both for home orchards and for market. The peaches are characterized by a distinct almond flavor, at the same time sweet and rich, which makes it a favorite with connoisseurs of good peaches. The variety is of unknown parentage, and originated with John B. Bass, Bass, Texas, some time previous to 1901.

Tree vigorous, upright, medium in size, open, healthy, productive. Fruit very early, medium in size, round-oblong; color creamy-white with a red blush; flesh creamy-white, melting, juicy, subacid, rich and sweet with decided almond flavor; quality good to very good; stone of medium size, plump, semi-cling.

WADDELL. Fig. 179. Waddell is an early midseason, white-fleshed, semi-cling peach from Georgia; a very evident descendant of Chinese Cling. The variety is now widely grown and is everywhere esteemed as a com-

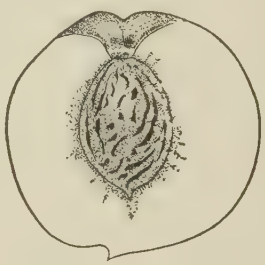


179. Waddell. (×½)

mercial sort. Its chief competitor is Carman, compared with which the fruit ripens a few days earlier; is handsomer, in color at least, the two being very similar in size and shape; is of rather finer texture of flesh, better flavored; and is a better shipper. The variety has not been nearly so widely nor so generally planted as the better-known Carman, but it has been a greater factor in the success of a score or more of the big commercial peach-orchards, North and South, of the last few years. It is a particularly pleasing peach, and ought to be considered for every commercial plantation where a variety of its season is wanted. Waddell is a chance seedling found by William Waddell, Griffin, Georgia, about 1890.

Tree medium in size, vigorous, spreading, with the lower branches inclined to droop, hardy, productive. Leaves 6 inches long, 1¾ inches wide, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, with 1-4 small, globose, reddish-brown glands. Flowers midseason, 1¾ inches across, red becoming pale pink, in clusters of twos. Fruit early midseason; 2¼ inches in diameter, round-oval, compressed, with unequal halves; cavity deep, abrupt, with tender skin, tinged with pink; suture shallow, deepening toward the apex and extending beyond; apex rounded, with a small, mucronate tip; color creamy-white, blushed with red and with dull splashes of darker red; pubescence thick; skin tough, separates from the pulp; flesh white, stained with pink near the pit, juicy, stringy, firm, sweet but sprightly, aromatic; very good in quality; stone semi-free to free, ovate; ventral suture deeply grooved along the sides, faintly winged.

WAGER. Fig. 180. Hardiness, productiveness, and early bearing are the outstanding characters of Wager that give it a high place in the peach-list. The fruit is a yellow-fleshed freestone, none too attractive in coloring, always rather small, and of only fair quality as a



180. Wager. (×½)

dessert fruit, but excellent for canning, drying, and all culinary purposes. The variety comes true to seed, or nearly so. The fruits of Wager are not attractive enough, and the trees are too small to make the variety of much value in commercial plantations, but it is a very good peach for home orchards and one of the best of all where hardiness is a prime requisite. Several distinct peaches are sold by nurserymen as Wager. The variety originated some time previous to 1870 with Benjamin Wager, West Bloomfield, New York.

Tree medium in size or small, upright-spreading, hardy, productive. Leaves 5½ inches long, 1¼ inches wide, obovate-lanceolate, thin, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ½ inch long, 2-4 small, globose or reniform glands. Flowers midseason, 1 inch across. Fruit midseason; 2½ inches in diameter, oval, sometimes conical, compressed, with unequal halves; cavity abrupt, often mottled with red and with tender skin; suture a line, becoming deeper toward the tip; apex pointed, with a mamelon, recurved tip; color orange-yellow, blushed and mottled with dark red; pubescence thick, long and fine; skin thin, tough, separates from the pulp; flesh yellow, faintly stained with red near the pit, meaty but tender, sweet, mild; good in quality; stone free, ovate, flattened near the base, with pitted surfaces, marked with few short grooves.

WALDO. Waldo is a peach of the Peento type which ripens with Peento, and is considered valuable for Florida and the coastal belt of the Gulf states. It is generally regarded as one of the best of its group for commercial purposes in the region in which it grows. The variety originated from a seed of Peento planted by T. K. Godbey, Waldo, Florida, about 1886.

Tree large and productive, open-topped, healthy; glands reniform. Fruit early, round-ovate, large; suture shallow but distinct; apex blunt, often with a strongly

marked, recurved tip; skin yellow washed with a delicate red and with a distinct blush on the sunny side; flesh yellowish-white, pinkish near the pit, juicy, the sweet, delicious flavor similar to that of Peento; stone rather small.

WHEATLAND. Wheatland is a large, yellow-fleshed, freestone peach of excellent quality, which ripens just before Late Crawford. It is popular in Michigan and very much grown in Colorado and Utah. The fruit is about all that could be desired, but the trees are so unproductive that the variety is seldom grown with profit. The beauty and high quality of the fruit make Wheatland desirable for home orchards. The variety is a chance seedling found about 1870 on the grounds of Daniel E. Rogers, Scottsville, New York.

Tree medium to large, vigorous, upright-spreading, with the lower branches drooping, hardy, rather unproductive. Leaves 6½ inches long, 1¾ inches wide, obovate-lanceolate, leathery; margin finely serrate; teeth tipped with reddish-brown glands; petiole ⅝ inch long, with one to five small, globose and reniform, reddish-brown glands. Flowers late, 1 inch across, light pink becoming darker along the edges. Fruit midseason; large, round; suture yellow, blushed and mottled with red; skin separates from the pulp; flesh yellow, stained red around the pit, juicy, firm but tender, sweet, pleasantly flavored; good in quality; stone free, ovate, broad at the base, with pitted surfaces.

WONDERFUL. Wonderful originated in New Jersey about 1889, and, after being cultivated in the East for a few years, was discarded in all peach regions except in the South and Southwest. The peaches are very similar to those of Smock, with which they are often confused. It is doubtful whether the variety should have a place where the better known Smock can be grown.

Tree medium to large, vigorous, upright-spreading, branches becoming drooped with age, only moderately productive; glands small, both globose and reniform in shape and varying in color. Flowers late, 1 inch in diameter, pale pink with darker pink at the edges. Fruit very late, medium in size, 2½ inches in diameter, oval, drawn in along the suture; cavity deep and narrow, abrupt; suture shallow, sometimes very faint but deepening at the apex; apex roundish with a mamelon tip which is often somewhat recurved; color light golden-yellow freckled with red, mottled, blushed and striped with deeper red; pubescence thick, long and coarse; skin rather thick, tender and adherent to the flesh; flesh yellow, red at the pit, rather dry, coarse, somewhat stringy; flavor sweet, rich, sprightly; quality fair to good; stone free, obovate, long-pointed, brown tinged with purple.

YELLOW RARERIPE. *Early Orange Peach. Cutter's Yellow.* A century ago Yellow Rareripe was at the head of the list of yellow-fleshed, freestone peaches—fruits largest, handsomest, and best-flavored of all. Even now in fruit- and tree-characters, with the single exception of productiveness, Yellow Rareripe holds its own very well with the peaches of its type and season. The chief fault is unproductiveness, to make up for which the trees usually bear regularly and come in bearing early. The variety is now hardly worth planting commercially, being equalled in all characters by several yellow-fleshed peaches and surpassed in productiveness by many; but, if the trees can be obtained, the variety might find a welcome place in home orchards. Yellow Rareripe originated near Flushing, New York, over a hundred years ago.

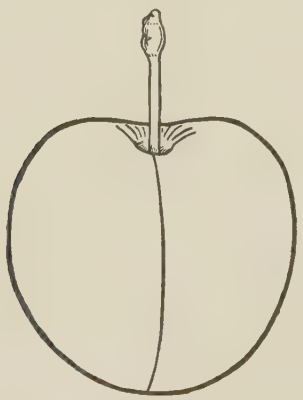
Tree large, vigorous, upright-spreading, rather unproductive. Leaves 6¾ inches long, 1¾ wide, obovate-lanceolate, leathery; margin finely serrate and sometimes in two series; teeth tipped with reddish-brown glands; petiole ½ inch long, glandless or with 1-4 small, globose glands. Flowers midseason, 1 inch across, light pink but darker along the edges, usually single. Fruit midseason; 2 inches in diameter, wide, round-conic, compressed, with unequal halves; cavity contracted and wrinkled about the sides, abrupt or flaring; suture shallow; apex round, with a mucronate or mamelon tip; color orange-yellow, with a deep red blush, splashed and mottled with red; pubescence thick, long, coarse; skin thin, tender; flesh yellow, tinged with red near the pit, juicy, fine-grained, tender and melting, sweet, pleasantly flavored; good to very good in quality; stone free, ovate, bulged near the apex, plump, tapering to a short point, with grooved and pitted surfaces.

CHAPTER XII

VARIETIES OF PLUMS

Fifteen species of plums, several of which are divided into sub-species, and varieties to the number of more than 2,000, are now under cultivation, most of which have at one time or another been grown in North America. From these figures, it is hardly too much to say that, of all drupe-fruits, plums furnish the greatest diversity of kinds. Species and varieties give a greater range of colors, forms, sizes, flavors, aromas, and textures than any other hardy fruit. The plants are quite as diverse as the fruits: some plums are true trees with stout trunks and sturdy branches, while others are shrubs with slender branches; some species have thin, delicate leaves; others coarse, heavy foliage; the flowers of some are large and attractive, of others small, unattractive, and possessing a disagreeable odor. In geographical distribution, wild and cultivated plums encircle the globe in the North Temperate Zone, the species and varieties being adapted to great diversities of soil and climate. Varieties from twelve species are described in the *Cyclopedia of Hardy Fruits*, practically all of which have come under the author's eye as grown at the Experiment Station, Geneva, New York.

ABUNDANCE. Fig. 181. *P. salicina.* Abundance is the best known of the Japanese plums. The two assets which have given the variety great popularity are adaptability to

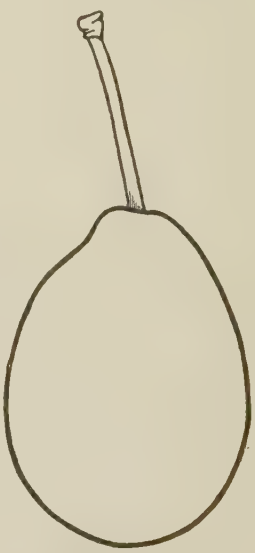


181. Abundance. (×1)

a wide diversity of soils and climates, and, as its name implies, abundance of fruit, for it bears not only heavily but also yearly. As a market plum, Abundance has several faults; the fruits ship and keep poorly, are subject to brown-rot, mature unevenly, and drop rather too readily as they ripen. The crop should be picked before quite ripe, as the plums develop in flavor best when picked early, and the dropping and rot are thus avoided. The variety is exceedingly variable, and undoubtedly several well marked strains could be selected, some of which are not so hardy or otherwise so valuable as others. Abundance was imported from Japan by Luther Burbank in 1884.

Tree large, vigorous, vasiform, open-topped, hardy, very productive. Leaves narrow-obovate, peach-like, 1½ inches wide, 3¼ inches long, thin; apex taper-pointed; base cuneate; margin very finely serrate, with small, brown glands; petiole ½ inch long, pubescent along one side, red, glandless or with 1-5 small, globose, green or reddish glands. Flowers appearing with the leaves, medium in size. Fruit early; 1½ inches in diameter, round-ovate, slightly compressed; cavity medium in depth and width, abrupt, regular; suture shallow, distinct; apex pointed; color dark red, mottled; bloom light; dots numerous, russet, conspicuous; stem ½ inch long, glabrous, parting easily from the fruit; flesh yellow, very juicy, tender and melting, sweet, pleasantly aromatic; good; stone clinging, oval, compressed, pointed, rough.

AGEN. Fig. 182. *P. domestica. D'Agen. French Prune. Petite Prune.* Agen is largely grown for prune-making in France and America. Several qualities admirably fit the fruits for curing into prunes. Thus, the plum has a high percentage of sugar and solids, so that it cures readily into a firm, sweet, long-keeping prune, which, in cooking, needs comparatively little sugar; the plums are uniform in size; the trees bear regularly and abundantly; the crop hangs well on the tree as it ripens, so that the curing really begins on the tree. Besides making most excellent prunes, Agen is a very good dessert plum and ought to be in every home orchard as well as in every commercial plantation. Lack of size in the fruit is the defect in



182. Agen. (×1)

this variety which has kept it from being more largely grown outside of prune-making regions. The name is derived from Agen, a region in France where the variety is extensively grown. In 1856, Louis Pellier, San Jose, California, introduced Agen on the Pacific coast, where it soon became and still is the leading plum.

Tree of medium size, upright-spreading, dense-topped, hardy, very productive. Leaves obovate, 1¾ inches wide, 3¼ inches long, velvety, thickly pubescent; apex abruptly pointed; base acute; margin doubly serrate; petiole 1 inch long, slender, pubescent, tinged red, with 2 or 3 small, globose, greenish-brown glands. Flowers midseason, 1⅛ inches across. Fruit late; 1½ by 1 inch, obovate, the base necked, halves equal; cavity shallow, narrow, flaring; suture very shallow, indistinct; apex roundish or flattened; color violet-purple; bloom light; dots numerous, small, brown, obscure; stem thick, 1 inch long, glabrous, adhering to the fruit; flesh greenish-yellow, tender, sweet, aromatic; very good to best; stone semi-free or free, oval, flattened, with pitted surfaces, abrupt at the base and apex.

AITKIN. *P. nigra. Beatty. Itasca.* Aitkin is favorably mentioned and undoubtedly has value for the Northwest. The variety was found growing wild in Aitkin County, Minnesota, by D. C. Hazelton on land adjoining his farm. It seemed to possess merit, and was introduced in 1896 by the Jewell Nursery Company, Lake City, Minnesota. Because it originated near Itasca Lake, it has been confused with the Itasca plum, which preceded it by nearly ten years.

Tree vigorous, productive, ripening its wood very early. Fruit earliest in season of its group; large for its class, oval, deep red, with no bloom; skin thin, not astringent; flesh yellow, juicy, sweet and rich; good; stone large, oval flattened, clinging.

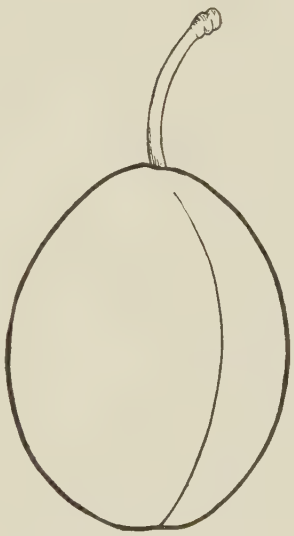
AMERICA. *P. Munsoniana* × *P. salicina.* America is the most promising cross between *P. Munsoniana* and *P. salicina.* The fruit is unusually attractive—golden-yellow with a red cheek and waxy lustre turning currant-red when ripe; it ships exceptionally well; and is of very good quality for cooking, but is without merit as a dessert plum. The trees are large, very vigorous, as hardy as either of its parents, and enormously productive. The qualities of fruit and tree are such that the variety ought to succeed in commercial plantations in which any but the hardiest native plums are cultivated. America is almost free from rot. This variety is one of Luther Burbank's productions, introduced by the originator in 1898.

Tree large, vigorous, spreading, open-topped, hardy, very productive. Leaves broadly lanceolate, peach-like, 1½ inches wide, 3¼ inches long, thin; apex taper-pointed; base abrupt; margin finely and doubly crenate, with numerous small, dark glands; petiole ½ inch long, tinged red, pubescent along one side, glandless or with 1 or 2 small, globose, reddish glands. Flowers midseason, ½ inch across. Fruit early; 1½ inches in diameter, round-oval, halves equal; cavity shallow, flaring; suture shallow, a distinct line; apex roundish; color clear, dark, currant-red over golden-yellow, mottled; bloom light; dots numerous, small, white, inconspicuous; stem slender, ½ inch long, glabrous, adhering to the fruit; flesh yellow, juicy, fibrous, tender, sweet; fair in quality; stone clinging, pointed, with pitted surfaces.

APRICOT. *P. domestica.* Since John Parkinson described the "Apricocke" plum in 1629, several types of this variety have appeared in literature; these have become so badly confused that it is impossible to separate them. Pomological writers now recognize at least two types, one of which is superior to the other. The better of these can readily be identified as the "Abricotee" of Duhamel, and should be considered the true Apricot. Little is known of the early history of this variety, except that it was very generally distributed throughout Europe early in the seventeenth century. The American Pomological Society rejected Apricot in 1858, though it is doubtful whether they had the true type. This variety is not to be confused with the *P. Simonii,* sometimes called "Apricot," or the native plum of the same name.

Tree large, vigorous, productive. Fruit midseason; large, roundish or slightly elongated, with prominent suture, yellow, blushed with red, overspread with thin bloom; flesh yellow, sweet, pleasant, slightly musky; good; stone small, free.

ARCH DUKE. Fig. 183. *P. domestica.* Arch Duke is one of the leading plums for the market. The qualities which give the fruit high place among commercial varieties are: large size, handsome color—a rich, dark



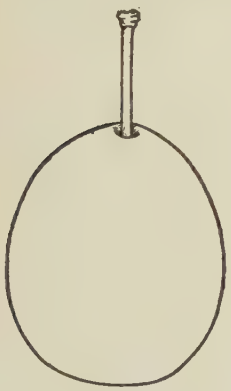
183. Arch Duke. (×1)

purple with thick bloom—and firmness of flesh and skin, so that it both keeps and ships well. The plum of Arch Duke compared with that of Grand Duke, known by all plum-growers, is nearly as large, with neck thicker, the same color, bloom heavier, quality higher, flesh firmer, stone free, and season earlier. The tree-characters, like the fruit-characters, are all good. While this variety is suitable for both home and market use, it appears after a thorough test in many parts of the country for nearly forty years to be especially well adapted for a market fruit. Arch Duke was raised by Thomas Rivers, Sawbridgeworth, England, and was sent out in 1883.

in prodigious quantities. The variety, however, is surpassed by many other Insititias, and has little value other than to show the steps between wild and cultivated fruits. Black Bullace is one of the oldest cultivated plums, and all data in regard to its origin have been lost.

Tree of medium size and vigor, upright, dense-topped, hardy, very productive. Leaves oval, 1½ inches wide, 3¼ inches long; apex abruptly acute; base acute; margin serrate or crenate, with a few, small, dark glands; petiole ¾ inch long, green, thickly pubescent, glandless or with 1 or 2 small, globose, greenish-brown glands. Flowers ⅞ inch across. Fruit late; 1¼ by 1 inch, oval, necked, halves equal; cavity small, shallow, narrow, flaring; suture lacking; apex roundish, with stigma adhering; color purplish-black; bloom heavy; dots numerous, small, brown, inconspicuous; stem ½ inch long, pubescent, adhering to the fruit; flesh greenish-yellow, juicy, fibrous, firm, sour; stone clinging, necked at the base, acute at the apex, with pitted surfaces.

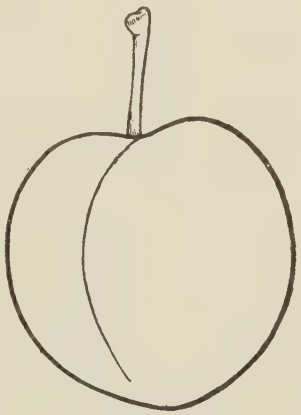
BRADSHAW. Fig. 185. *P. domestica. Black Imperial. Blue Imperial. Niagara.* A study of this variety does not justify its great popularity. The trees grow slowly and are tardy in coming into bearing; the fruit is not especially high in quality, and in many regions is attacked by brown-rot too freely for profitable orchard culture. To offset these faults, the trees are large, well formed, bear regularly and heavily, are robust and healthy; and the plums are large, attractive in appearance, and keep and ship well, especially if picked a little green. The variety is not nearly so badly attacked by San Jose scale as other plums. Probably one of the reasons why Bradshaw is so largely grown is that it is easily handled in the nursery and quickly makes a very good nursery tree. The value of the crop is greatly lessened because it ripens in the midst of the peach season. The origin of this plum is not known; it was named by C. M. Hovey in 1846.



185. Bradshaw. (×¾)

Tree large, vigorous, broad-vasiform, dense-topped, hardy, very productive. Leaves drooping, obovate, 2 inches wide, 4¼ inches long, thick; apex acute; base abrupt; margin not regular, coarsely crenate or serrate, eglandular or with a few, small, dark glands; petiole ¾ inch long, pubescent, red, glandless or with 1-3 large, globose, greenish-brown glands. Flowers 1 3/16 inches across. Fruit midseason; 2 by 1¾ inches, oval, compressed, halves equal; cavity shallow, narrow, abrupt, with a fleshy ring around the stem; suture very shallow; apex flattened; color dark reddish-purple; bloom heavy; dots numerous, small, russet, inconspicuous clustered about the apex; stem thick, 1 inch long, pubescent, adhering strongly to the fruit; flesh dull yellow, often with a trace of red, juicy, fibrous, tender, sweet, pleasant; good; stone semi-free, flattened, irregularly oval, necked at the base, blunt at the apex, strongly roughened and pitted.

BURBANK. Fig. 186. *P. salicina. Wassu.* Abundance holds first place among Japanese plums, but Burbank is a close second, and in many localities has preference. Abundance is in the lead because its trees are larger, better formed, and bear more fruit than those of Burbank. To offset the advantages of Abundance, the fruit of Burbank is of better quality, more handsomely colored, keeps and ships better, is less susceptible to brown-rot; and ripens a week or more later, which in most seasons is a slight advantage. The trees of this plum are distinguished from those of all other plums by their low, spreading habit, flat top, and drooping branches, characters which make them more or less difficult to handle in the orchard and nursery. The wood of Burbank is brittle, a serious defect. The fruit begins to color some days before ripe, and should be picked before mature if it is to be kept or shipped. Thinning is necessary in all commercial orchards. The variety does not thrive in the South, the fruit being poor in quality and rotting badly. Burbank was produced from a plum pit sent to Luther Burbank by a Japanese agent in 1883.

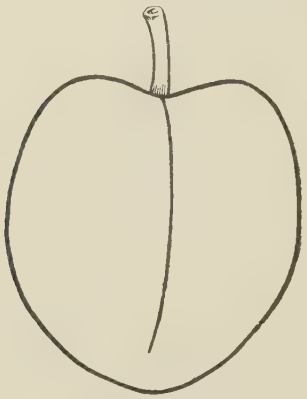


186. Burbank. (×1)

Tree large, vigorous, distinguished by its low, sprawling habit and flat, open top, unusually hardy, very productive, healthy. Leaves broadly oblanceolate, peach-like, 1 inch wide, 3¾ inches long, thin; apex taper-pointed; base cuneate; margin finely and doubly serrate, with small amber or reddish glands; petiole ⅛ inch long, sparingly hairy on one side, tinged red, with 1-4 small, reniform or globose glands. Flowers appearing with the leaves. Fruit early; variable in size, large, 1¾ inches in diameter, round-conic, halves equal; cavity deep, abrupt, regular; suture shallow; apex roundish; color dark red over a yellow ground, mottled; bloom heavy; dots numerous, large, russet, conspicuous; stem ⅝ inch long, glabrous, parting readily from the fruit; flesh deep yellow, juicy, tender, firm, sweet, aromatic; good; stone clinging, round-oval, turgid, blunt but sharp-tipped, rough.

CHABOT. Fig. 187. *P. salicina. Babcock. Bailey. Chase. Douglas. Orient. Paragon. Yellow Japan.* The fruits of Chabot are large, beautifully molded, handsomely mottled in shades of red over yellow with occasional

splashes of russet, and have a heavy but delicate bloom. To secure the best coloring, the fruit must be picked before ripe and be matured in dark storage. Early picking is necessary, also, because the season of ripening is long, and the fruit drops badly if permitted to hang on the trees until fully ripe. Unfortunately, the quality of the fruit belies its appearance,



187. Chabot. (×1)

being at best not above average. The plums are firm, ship well, and keep rather better than those of any other variety of its species. The trees are hardy and dependable in bearing, but are not productive. The blossoms of Chabot open late, so that this sort escapes frosts which injure other varieties of its species. The stamens are often short, undeveloped, and wholly or in part sterile. Chabot was imported from Japan by a Mr. Chabot, Berkeley, California, and was introduced by Luther Burbank in 1886.

Tree large, vigorous, upright-spreading, open-topped, slow-growing, hardy, productive, susceptible to attacks of shot-hole fungus. Leaves obovate, peach-like, 1¼ inches wide, 3 inches long, thin; apex acutely pointed; base cuneate; margin finely serrate, with small, amber or dark red glands; petiole ½ inch long, slender, pubescent along the upper surface, heavily tinged with red, glandless or with 1-6 small, globose or reniform, greenish-brown glands. Fruit midseason; 1¾ inches in diameter, cordate or roundish, halves equal; cavity deep, flaring, with concentric, russet rings; suture distinct; apex roundish or pointed; color light and dark shades of red over yellow, mottled, with occasional splashes of russet; bloom heavy; dots numerous, small, russet or yellow, conspicuous, clustered around the apex; stem thick, ½ inch long, adhering to the fruit; flesh golden-yellow, very juicy, coarse, fibrous, tender, melting, sweet, sprightly; good; stone clinging, oval, turgid, necked, with pitted surfaces.

CHALCO. *P. Simonii* × *P. salicina.* Chalco has been extensively advertised, but it is doubtful whether it will ever be grown commercially. The trees are slow in coming into bearing; the fruits are small; and the flavor such that consumers will have to learn to like it, although it is much better in quality than the Simon plum, one of its parents. The tree is better than that of the Simon plum or of the Wickson, the two plums with which it must be compared. Burbank, in introducing this plum in 1898, stated that it was the first fruit offered after twelve years' work in erossing *P. Simonii* with *P. salicina* and American species. The parentage of Chalco is given as a Simon-Burbank cross.

Tree vigorous, upright or vasiform, very productive; leaves large, dark green. Fruit matures shortly before Burbank; large, when well grown, oblate, dark red; flesh yellowish, firm, very juicy, aromatic, sweet; good; stone small, oval, slightly flattened, semi-free.

CHENEY. *P. nigra.* Cheney is of little value except towards the northern limits of fruit-culture in America, where, because of its great hardiness, it is a most desirable fruit-plant. The fruit of this variety is not such as to recommend it where other species can be grown, but the tree has some characters most desirable wherever plums are grown—hardiness, vigor, productiveness, and good form. The trees are very ornamental whether in flower, full leaf, or fruit, but especially when in full bloom, as they bear a great profusion of large white flowers which change to pink before falling. Cheney was discovered by E. Markle, La Crosse, Wisconsin, about 1880.

Tree large, vigorous, spreading, dense-topped, hardy, productive, bears early. Leaves oval, 1¾ inches wide, 3½ inches long, thin; apex taper-pointed; margin crenate, usually in two series, sometimes with small, dark glands; petiole ½ inch long, slender, pubescent, tinged red, glandless or with from 1 to 3 small, globose, greenish-yellow glands. Flowers showy, about 1 inch across, white changing to pink. Fruit midseason; medium in size, round-oval, oblique, halves equal; cavity shallow, regular, flaring; suture a line; apex roundish, oblique; color deep carmine on a yellow ground; bloom light; dots numerous, very small, russet, densely clustered about the apex; stem slender, ⅝ inch in length, pubescent, adhering to the fruit; flesh deep yellow, very juicy, fibrous, tender, melting, sweet next to the skin, tart at the center; fair in quality; stone adhering, broadly oval, distinctly flattened, blunt-pointed, with ridged and furrowed surfaces.

CLIMAX. *P. salicina* × *P. Simonii. Royal.* From its behavior in the plum-growing regions of the East, it seems certain that Climax cannot stand the vicissitudes of the climate, since it suffers both in winter and in summer. The trees, in size, vigor, and habit of growth, are inferior to those of most Japanese varieties, and are not so productive. The fruit is handsome in shape and color, and is of good quality. Unfortunately, the fruit is very susceptible to brown-rot, so much so that Climax could hardly become a profitable commercial plum where this fungus is found. The variety has been well tested, and has proved so uniformly disappointing in tree-characters that it cannot be recommended except for the home collection, in which, because of the beauty and high quality of the fruit, it is most desirable. Climax is another of Luther Burbank's plums, having been introduced in 1899.

Tree large, vigorous, upright-spreading, straggling, dense-topped, semi-hardy, medium productive. Leaves oblanceolate, peach-like, 1¼ inches wide, 3¼ inches long, thin; apex taper-pointed; base cuneate; margin finely serrate or crenate, with small, dark brown glands; petiole $\frac{9}{16}$ inch long, sparsely pubescent, tinged red, glandless or with 1-7 small, globose or slightly com-

pressed, reddish glands. Fruit very early; 1¾ inches in diameter, cordate, compressed, halves unequal; cavity deep, abrupt, regular, marked with faint, reddish, radiating streaks; suture deep, broad; apex pointed; color dark red, mottled; bloom heavy; dots numerous, variable in size, russet, conspicuous, clustered about the base; stem thick, $\frac{2}{16}$ inch long, glabrous, parting readily from the fruit; flesh yellow, very juicy, fibrous, tender, melting, sweet, aromatic; good; stone adhering, long-oval, pointed, rough.

CLYMAN. *P. domestica.* Clyman has special merit as one of the earliest good Domesticas. The fruit resembles that of Lombard, but is smaller and much better in quality. As grown in California, the product commands high prices for shipping eastward. The variety has a few serious faults: the plums are susceptible to rot; they drop as soon as ripe; and the trees seem not to be quite hardy in New York, although in Ohio they are said to be "rather hardier than those of most other European sorts." The variety is characterized by flowers bearing very long stamens. Clyman well deserves trial, with the possibility that it may prove to be the best of our early Domesticas. This plum was raised from a Peach plum-stone planted in 1866 by Mrs. Hannah Clyman, Napa City, California.

Tree large, vigorous, round and dense-topped, semi-hardy, productive. Leaves obovate, 2 inches wide, 3¼ inches long; apex abruptly pointed, base acute; margin serrate or crenate, covered with small, dark glands; petiole 1 inch long, pubescent, reddish, glandless or with 1-3 globose, greenish-yellow glands. Flowers 1⅛ inches across. Fruit very early; 1½ by 1⅜ inches, oval, halves equal; cavity narrow, abrupt, regular; suture shallow and often indistinct; apex roundish or slightly depressed; color dark purplish-red; bloom heavy; dots numerous, small, russet, inconspicuous; stem ¾ inch long, pubescent, parting readily from the fruit; flesh pale yellow, dry, firm, sweet, mild, pleasant; of good quality; stone free, flattened, irregular-oval, with pitted surfaces, tapering abruptly at the base, acute at the apex.

COLUMBIA. *P. domestica.* When grown on strong soils and in some climates, Columbia is possibly a plum of value and sometimes of superiority, but in the average plantation it falls far short of other fruits of its type—that of Reine Claude. The trees are productive, and the fruits are large and handsome, but not of highest quality; moreover, they drop badly and are very susceptible to the brown-rot. Columbia originated early in the second quarter of the nineteenth century with L. V. Lawrence, Hudson, New York, from a seed of Reine Claude.

Tree large, medium in vigor, upright-spreading, open-topped, productive. Leaves 2 inches wide, 4¼ inches long, oval, thick, leathery; margin serrate or crenate, with small, dark glands; petiole thick, tinged red, pubescent, with 1-3 globose glands. Fruit midseason; 1½ inches in diameter, round-oval, small specimens ovate, dark purplish-red; bloom heavy; stem surrounded by a fleshy ring at the cavity; flesh golden-yellow, dry, sweet, mild; good; stone semi-free or free, round-oval, flattened.

COMPASS. *P. Besseyi* × *P. hortulana Mineri. Compass Cherry. Heideman Sand Cherry.* In 1891, H. Knudson, Springfield, Minnesota, pollinated Sand cherry with pollen from the Miner plum. The seed of the resulting cross was planted, and in 1894 produced fruit. In 1893, C. W. H. Heideman, New Ulm, Minnesota, took cions from this tree. In 1895, Heideman introduced the Heideman Sand cherry, "a hybrid between the Sand cherry and a plum." Subsequently, C. W. Sampson, Eureka, Minnesota, introduced Knudson's plum under the name Compass. The variety is of interest to plant-breeders, and may have some commercial value in the Northwest.

Tree small, spreading, open-topped, productive; branchlets marked by very conspicuous, large, raised lenticels. Leaves 1 inch wide, 3 inches long; margin serrate; petiole tinged red, glandless or with 1-3 globose glands on the base of the leaf. Flowers ⅞ inch across. Fruit early; 1 by ¾ inch, ovate, dark red, the skin speckled with small red dots before fully ripe; skin tough, astringent; flesh light yellow, very juicy, melting, subacid except near the skin; poor; stone clinging, large, elongated-oval, with smooth surfaces.

DAMSON. *P. insititia.* The common Damson, the Damson of the ancients, probably little changed since before Christ's time, is still worthy of cultivation, even though a score or more of its offspring are offered to take its place. In productiveness, vigor of tree, and hardiness, it surpasses any of its kind, and while its fruits are smaller and more astringent than those of the best of its offspring, they are not surpassed for the chief uses of all Damsons—the making of preserves. The great asset of Damson is its adaptability to various soils and climates, as it surpasses in this respect all newcomers of its type. So, while undoubtedly some of the improved Damsons are better than the parent variety under many conditions, there yet remain localities in which the original stock is possibly most valuable. Damson takes its name from Damascus, whence it was brought into Italy at least a century before the Christian era. What is a Damson? In England and America it is an oval, black Insititia. The European continental countries have an entirely different conception of a Damson. The Germans speak of all common plums as "Damson-like" while the French use the term "Damas" indiscriminately. The English have not always sharply distinguished Damson, for Parkinson, in 1629, speaks of "the great Damaske or Damson Plummes" as sweet prunes imported from France; and Gerard, in 1636, described the Damson tree as synonymous with the plum.

DE CARADEUC. *P. cerasifera. Caradeuc.* De Caradeuc is one of the few representatives of *P. cerasifera* cultivated for fruit. The plums are garnet-red, very attractive in appearance, and are borne so much earlier than those of other species that the variety may be worth planting in home orchards to lengthen the season and for the sake of variety. De Caradeuc is grown rather commonly in the South, where the fruits are said to keep well and not to rot. The trees are handsome ornamentals bearing remarkably rich, green foliage, and a profusion of white flowers, which are followed by beautifully colored fruits. The variety can be recommended for lawns or

parks in which a small, compact, flowering tree is wanted. De Caradeuc originated with A. De Caradeuc, Aiken, South Carolina, between 1850 and 1854.

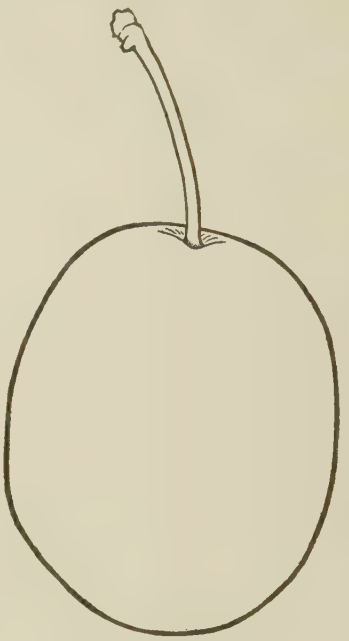
Tree very large, vigorous, spreading, open-topped, variable in productiveness. Leaves oval, 1 inch wide, 2 inches long, thin; apex acute; base broadly cuneate; margin often in two series of fine serrations, without glands; petiole slender, ½ inch long, pubescent, tinged with red, eglandular or with 1 or 2 very small, globose, greenish glands. Flowers 1 inch across. Fruit very early; 1¼ inches in diameter, round, halves usually equal; cavity shallow, narrow, abrupt, regular; suture a dark line; apex roundish; color crimson-red over a yellow ground; bloom light; dots few, light, russet, clustered about the apex; stem slender, ¾ inch in length, glabrous, adhering to the fruit; flesh yellow, very juicy, fibrous, tender and melting; sweet; poor in quality; stone clinging, round-oval, turgid, blunt, with pitted surfaces.

DE SOTO. Fig. 188. *P. americana. Trayer.* De Soto holds first place among Americana plums in the favor of fruit-growers. The variety is better suited to the orchard than other Americanas, having little of the waywardness in tree of most sorts of its species. The trees, also, are enormously productive, so much so that in many cases their vitality is weakened by overbearing, unless thinned. The fruits of De Soto, while not so large nor so brilliantly colored as those of some of the Americanas, are not surpassed in quality by the product of any, and keep and ship as well as any. The variety becomes, therefore, a market sort of value in some regions. The fruits are more subject to curculio than those of most of the native plums. De Soto blights in the South somewhat, and does not stand the drouths of the Mississippi Valley so well as some other varieties. De Soto was found on the bank of the Mississippi River near De Soto, Wisconsin, by a Mr. Tupper, in 1853.

188. De Soto. (×1)

Tree small, spreading, open-topped, hardy, produces heavy crops annually, bears young. Leaves falling early, oval, 1¾ inches wide, 4 inches long; apex taper-pointed; base abrupt; margin very coarsely and deeply doubly serrate; petiole ⅝ inch long, pubescent, tinged red, glandless or with 1 or 2 globose, brownish glands. Flowers 1½ inches across. Fruit midseason; 1½ inches in diameter, round, compressed, often strongly truncate at the base; cavity shallow, abrupt; suture very shallow or a line; apex round or somewhat pointed; color dark crimson over orange-yellow ground; bloom light; dots very numerous, small, light russet, inconspicuous; stem slender, ¾ inch long, sparingly pubescent; flesh golden-yellow, very juicy, fibrous, tender, melting, mild; fair to good; stone nearly free, oval, turgid, blunt-pointed, smooth.

DIAMOND. Fig. 189. *P. domestica. Black Diamond.* To judge Diamond by appearance of fruit would be a grievous error. The plums are large, beautifully colored, well-formed and tempting to the eye, but one taste out of hand is sufficient. The flesh is coarse, and the flavor unpleasant to one accustomed to good plums. The firm flesh and tough skin of the fruits commend them as market plums. The trees are above average in size, vigor, hardiness, and productiveness. Thus, all characters excepting quality of fruit bespeak the favor of plum-growers. Diamond is planted largely for the markets, in which the plum sells on appearance. This variety was raised from seed in Kent, England, by a man named Diamond, its origin antedating 1831.



189. Diamond. (×1)

Tree above average in size and vigor, upright-spreading, dense-topped, hardy, very productive. Leaves obovate, 2 inches wide, 3¼ inches long; apex obtuse; base acute; margin serrate, with small, brown glands; petiole ⅝ inch long, slender, pubescent, reddish, with 1-4 small, globose or reniform, greenish-yellow glands. Flowers 1 inch across. Fruit midseason; 2 by 1¾ inches, oval, necked, swollen on the ventral side, compressed; cavity very narrow and abrupt; suture shallow, often a line; apex round or pointed; color dark purplish-black; bloom heavy; dots numerous, small, russet, inconspicuous; stem slender, 1 inch long, finely pubescent, adhering well to the fruit; flesh pale yellow, sometimes with a faint red tinge next the skin, coarse, firm, mild, subacid; of fair quality; stone with a trace of red, semi-clinging, long-oval, necked at the base, abruptly sharp-pointed at the apex, with pitted surfaces.

DOWNING. *P. Munsoniana. Charles Downing.* Downing is one of the best varieties of its species. The trees are large, usually productive, not often sterile as are some of its near kin; and, for a southern plum, the variety is remarkably hardy. The only fault

that can be found with the tree is that the foliage is rather susceptible to shot-hole fungus. The fruit is particularly attractive, with its bright, solid, garnet-red skin, golden flesh, and sweet, pleasant flavor. Unfortunately, the flesh is a little too fibrous, and clings too tenaciously to the stone for pleasant eating. Downing adds a pleasing variety to any collection of plums, and in some regions ought to sell with profit. H. A. Terry, Crescent, Iowa, grew Downing from seed of Wild Goose. It is reported as first fruiting in 1885.

Tree large, spreading, flat-topped, hardy, variable in productiveness. Leaves broadly lanceolate, peach-like, 1½ inches wide, 3 inches long, thin; apex taper-pointed; margin finely serrate, eglandular or sometimes with small dark glands; petiole ¾ inch long, slender, tinged with red, pubescent along one side, glandless or with 1-5 small, globose, yellowish-red glands. Flowers 1⅛ inches across, with a strong, disagreeable odor. Fruit midseason; 1⅛ inches in diameter, round-ovate, halves equal; cavity shallow, narrow, flaring; suture obscure; apex round; color garnet-red; bloom light; dots numerous, variable in size, grayish-yellow, conspicuous, clustered around the apex; stem slender, about ⅜ inch in length, glabrous, parting readily from the fruit; flesh golden-yellow, juicy, coarse, fibrous, tender, melting, aromatic; good; stone clinging, oval, oblique, turgid, rough.

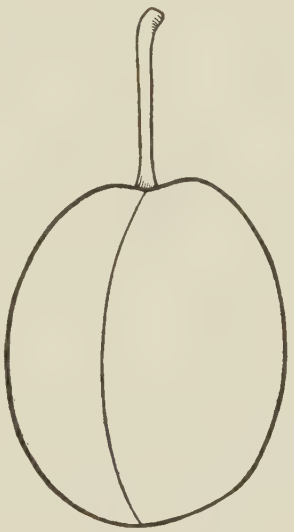
DRAP D'OR. *P. insititia. Cloth of Gold. Yellow Damask. Yellow Gage.* Drap d'Or is one of the Mirabelle plums, representing a type hardly known in America but very popular in continental Europe, and the most popular of all plums in France. No doubt the division of *P. insititia* represented by Drap d'Or will thrive in America as well as the commonly grown Damsons of the same species. Drap d'Or is one of the best of the yellow, sweet Insititias, and is well worth trial. The variety was cited by Merlet, 1675, and is of old and uncertain origin.

Tree small, upright-spreading, dense-topped, hardy, productive. Leaves oval, 1¼ inches wide, 2½ inches long; apex pointed; base abrupt; margin serrate or crenate, eglandular or with small dark glands; petiole ½ inch long, pubescent, tinged red, glandless or with 1-3 globose, greenish-yellow glands. Flowers 1 inch across. Fruit midseason; 1 inch in diameter, round-oval, compressed, halves equal; cavity shallow, narrow, flaring; suture very shallow, often a line; apex round or depressed; color golden-yellow, mottled and blotched, occasionally with a faint bronze blush on the exposed cheek; bloom light; dots numerous, small, white; stem slender, sparingly pubescent, adhering to the fruit; flesh light golden-yellow, juicy, firm but tender, sweet, mild; of good quality; stone free, oval, flattened, smooth, blunt at the base and apex.

DUANE. *P. domestica. Purple Magnum Bonum. Purple Egg.* Duane was once known the country over and in Europe as well. Its popularity was due to the large size, royal purple color, and firm golden flesh of the fruits—characters which fit it admirably for the store and the stand. But appearance is the only asset of the fruit so far as the consumer is concerned—the flesh is dry, tough, sour, and clings to the stone, making a plum unfit for dessert, although it does very well for culinary purposes. The fruits ripen slowly and color a week or more before ripe. The trees excel in size, vigor, and productiveness, are usually hardy, and bear their crop well distributed. In minor characters, the trees are distinguished by large leaves, pubescent on the under side, and by grayish drab shoots covered with dense pubescence. The popularity of the variety is now on the wane. Duane originated as a seedling in the garden of James Duane, Duanesburgh, New York, about 1820.

Tree large, vigorous, round and dense-topped, hardy and productive. Leaves obovate, 1½ inches wide, 3½ inches long; apex acute; base cuneate; margin serrate, eglandular or with small amber glands; petiole ½ inch long, pubescent, tinged with red, eglandular or with 1 or 2 small, globose, greenish-brown glands. Flowers 1 inch across. Fruit midseason; 1¾ by 1⅝ inches, broadly oblong-oval, compressed, halves unequal; cavity shallow, narrow, abrupt; suture variable in depth; apex round or depressed; color purplish-black; bloom heavy; dots numerous, light russet; stem ¾ inch long, pubescent, adhering well to the fruit; flesh pale yellow, firm, sour; of fair quality; stone adhering, oval, with pitted surfaces, blunt at the base and apex.

ENGLEBERT. Fig. 190. *P. domestica. Prince Englebert.* Englebert is a prune, its origin, shape, color, and firm golden-yellow flesh all marking it as such, but in prune-making regions the crop is usually marketed



190. Englebert. (×1)

in the green state. The fruits cannot be said to be much more popular as plums than as prunes, chiefly because they are not of high quality, but also because they are not attractive in color, size, or shape, cutting a poor figure in comparison with a great number of other Domestica plums. The variety fails in tree as well as in fruit. The trees are variable in size, suffer from cold in exposed situations, and, while productive, bear their crops in clusters hard to pick and so placed as to insure infection from brown-rot when that disease is epidemic. Englebert grew from a seed of the Date prune, on the grounds of M. Scheidweiler, Ghent, Belgium.

Tree variable in size, vasiform, dense-topped, hardy, productive. Leaves oval, 2 inches wide, 3¼ inches long; apex roundish-pointed; base obtuse; margin finely crenate, eglandular or with small dark glands; petiole ¾ inch long, pubescent, faintly tinged red, glandless or with 1 or 2 small, globose, greenish-yellow glands. Flowers 1 inch across. Fruit midseason; 1⅝ by 1⅜ inches, oval, swollen on the suture side, halves equal; cavity shallow, narrow, abrupt; suture a line; apex bluntly pointed or roundish; color dark purplish-black; bloom heavy; dots numerous, russet; stem ¾ inch long, pubescent, adhering well to the fruit; flesh golden-yellow, juicy, coarse, firm, sweet, pleasant-flavored, sprightly; good; stone oval, strongly flattened, with roughened and deeply pitted surfaces, blunt at the base and apex.

EXCELSIOR. *P. salicina* × *P. Munsoniana.* This variety originated with G. L. Taber, Glen Saint Mary, Florida, in 1887, from seed of Kelsey supposed to have been pollinated by Wild Goose, although some authorities believe De Caradeuc to have been the male parent. It seems to be a promising variety in the South, and was mentioned in the last three catalogs of the American Pomological Society.

Tree vigorous, vasiform; branches slender; leaves of medium size, narrow; margin finely crenulate, glandular; petiole short, with from one to three small glands; flowers small, scattered. Fruit early; of medium size, roundish, dark red with heavy bloom; skin tough; flesh firm, yellowish, with red tinge towards the center; quality good; stone of medium size, compressed, clinging.

FIELD. *P. domestica. Early Bradshaw.* This offspring of Bradshaw resembles its parent in tree, and in size, color, and shape of fruit, although not so closely as to be readily mistaken for the older variety. Differences which distinguish the fruits of the two are: those of Field are a trifle smaller; more nearly round; lack the prolonged neck of the Bradshaw fruit; and are more plump at the base. Field ripens its fruit earlier than Bradshaw, the latter difference accounting for the synonym, "Early Bradshaw." In tree-characters, Bradshaw excels in having a larger tree and in being more productive. The foliage of Field is very good; it ripens its wood well; begins to bear while young; but is inclined to a biennial-bearing habit, which makes the average in quantity of fruit low. Like Bradshaw, Field is little attacked by San José scale. Field is a seedling of Bradshaw grown in Schoharie County, New York, a generation ago.

Tree of medium size and vigor, upright-spreading, dense-topped, hardy, productive. Leaves obovate, 2 inches wide, 4½ inches long; apex abruptly pointed; base acute; margin serrate, with a few, small, black glands; petiole 1 inch long, thick, tinged with red, sparingly pubescent. Flowers 1 inch across. Fruit midseason; 2 by 1½ inches, oblong-oval, compressed, halves equal; cavity shallow, narrow, abrupt; suture shallow, broad; apex roundish; color dark purplish-red; bloom heavy; dots numerous, small, russet, clustered about the apex; stem ¾ inch long, pubescent, adhering well to the fruit; flesh greenish-yellow, juicy, sweet, mild; of fair quality; stone clinging, ovate, with roughened and pitted surfaces, blunt at the apex and base.

FOREST GARDEN. *P. hortulana Mineri.* Forest Garden is widely distributed in the Central West, where both in tree- and fruit-characters it seems adapted to the needs of climate and soil. The fruit is late, maturing at a good time for shipping, for which it is further adapted by tough skin and firm flesh; and, while not preëminently well fitted for dessert, it has a spicy flavor that makes it pleasant eating and admirably adapted for culinary purposes, especially for preserving. This variety is from a wild plum found in the woods near Cedar Rapids, Iowa, by Thomas Hare, about 1862.

Tree large, very vigorous, spreading, with sprawling habit, flat-topped, perfectly hardy, variable in productiveness, bearing young, susceptible to shot-hole fungus. Leaves falling early, elongated-oval, peach-like, 1¾ inches wide, 4¼ inches long, thin and leathery; apex taper-pointed; base abrupt; margin doubly crenate, glandular; petiole ¾ inch long, sparingly pubescent, faintly tinged with red, usually with 2 conspicuous, globose, brownish glands. Flowers ⅞ inch across, with a strong, disagreeable odor. Fruit late; 1⅛ inches in diameter, large, round-ovate, compressed, halves equal; cavity shallow, wide, flaring; suture a line; apex roundish or pointed; color dark red; bloom light; dots numerous, russet, conspicuous; stem slender, ⅝ inch long, glabrous, detaching from the fruit at maturity; flesh dark golden-yellow, juicy, coarse, fibrous, melting, sweet next the skin, sour toward the center, with a strong and peculiar flavor, aromatic; good; stone clinging, oval, turgid, blunt, flattened at the base, ending in an abrupt but sharp point at the apex, smooth.

FOREST ROSE. *P. hortulana Mineri.* Forest Rose and Forest Garden are similar in many characters. The fruit of Forest Rose, however, is not so attractive in color, is smaller, and does not keep nor ship quite so well as that of Forest Garden, but it is better in quality; and the variety is better adapted for the home orchard at least. While somewhat variable in productiveness in most localities, Forest Rose bears annually and abundantly. The trees are more thorny than those of most of its species. This variety is said to be a seedling of Miner, grown by Scott & Company, a Missouri nursery firm, about 1875.

Tree medium to large, upright-spreading, open-topped, hardy, variable in productiveness, susceptible to attacks of shot-hole fungus. Leaves falling very early, obovate, 1½ inches wide, 4 inches long, thin; apex acuminate; base acute; margin crenate or serrate, with small, dark glands; petiole slender, ½ inch in length, sparsely pubescent along one side, tinged with red, glandless or with 1-3 small, globose or oval, greenish-brown glands. Flowers ⅞ inch across, white, with a disagreeable odor. Fruit late; 1⅛ by 1 inch, round-oval; cavity shallow, flaring; suture a line; apex roundish; color dull crimson; bloom light; dots very numerous, small, gray, conspicuous; stem slender, ¾ inch long, smooth, parting from the fruit; flesh dull apricot-yellow, juicy, fibrous, tender, melting, sweet next to the skin, tart toward the center, aromatic; good; stone clinging, oval, acute at the apex, with pitted surfaces.

FORMOSA. *P. salicina* × ? Formosa is one of Luther Burbank's new plums introduced by the Fancher Creek Nurseries, Fresno, California, in 1907. The variety is now rather commonly grown in California, but is scarcely known elsewhere. Burbank says that it is of mixed parentage and "probably includes the blood of from fifteen to eighteen varieties." Tree and fruit show many characters of the Japanese plums.

Tree very vigorous and productive, fruiting annually and heavily, tender to cold, healthy in the Pacific states. Fruit midseason, medium to large, oval or slightly cordate; suture deep and very prominent; cavity me-

dium, abrupt; skin smooth, a little tough, somewhat astringent, rich yellow, turning to a clear red at maturity; bloom light but distinct; flesh pale yellow, firm, sweet, rich, of a very decided apricot flavor; quality good to very good; stone rather large, oval, turgid, clinging.

FRENCH. Fig. 191. *P. insititia.* French surpasses all other plums in its group. The plums are large, so large, indeed, as to lead to the belief that French is a hybrid with some Domestica plum; the size of the trees, blossoms, and foliage also leads to such a supposition. This excellent Damson is largely grown for the market, for good quality as well as size and appearance of the fruit aid in selling the product. The fruits have but one defect, the pit is large for the amount of flesh. But it is in tree-characters that French best shows its superiority over other Damsons. The trees are large, hardy, bear abundantly and annually, and carry their foliage so well that fruit and wood usually ripen perfectly. The season is a little after that of the more commonly grown Shropshire, in most years an advantage. The origin is unknown, but it is probably an old variety renamed.

191. French. (×1)

Tree large, vigorous, spreading, dense-topped, hardy, productive. Leaves long-oval, 1¼ inches wide, 3 inches long; apex abruptly pointed; base abrupt; margin serrate or nearly crenate, with a few small, dark glands; petiole ¾ inch long, slender, pubescent, faintly tinged with red, usually having 2 very small, globose, greenish-brown glands. Flowers 1¼ inches across. Fruit late; 1½ by 1⅛ inches in diameter, ovate, halves equal; cavity very shallow, flaring; suture a line; apex roundish; color dull black; bloom thick; dots numerous, small, inconspicuous; stem slender, ¾ inch long, pubescent, adhering well to the fruit; flesh greenish, juicy, fibrous, tender, sweet, pleasant, sprightly; good; stone variable in adhesion, oval, roughened, acute at the base, blunt at the apex.

FROGMORE. *P. insititia. Frogmore Damson.* Frogmore may be considered among the best of the Damsons for the culinary purposes to which this fruit is commonly put. The flesh is tender, sweet, and good, but adheres rather too tightly to the stone. The tree of Frogmore is all that could be desired in productiveness, and quite equals that of most other Damsons in length of time that it holds its crop after maturity. The habit of growth of this variety varies from that of *P. insititia* as commonly found, the leaves being larger, the tops more spreading, and the branches less thorny. According to the *Florist and Pomologist,* published in 1876, this variety originated a few years previous to the date of publication in the Royal Gardens, Frogmore, England.

Tree small, round-topped, open, hardy, very productive. Leaves bright red on first opening, obovate, 1½ inches wide, 3½ inches long; margin eglandular; petiole ⅝ inch long, slender, green, glandless or with 1 or 2 small, globose, yellowish-green glands. Flowers 1 inch across. Fruit late; 1⅛ by 1 inch, round-oval, compressed, purplish-black; bloom heavy; flesh golden-yellow, juicy, tender, sweet; good; stone clinging, oval, smooth, acute at base and apex.

GAVIOTA. *P. salicina* × ? Gaviota is another of Luther Burbank's plums, the parentage of which he gives as a Japanese plum crossed with an Americana, although he says "it probably contains admixtures of other species than the two named." The variety was introduced by the Fancher Creek Nursery Company, Fresno, California, in 1907, and is grown only in the Pacific states, where it seems to be increasing in popularity, especially in California.

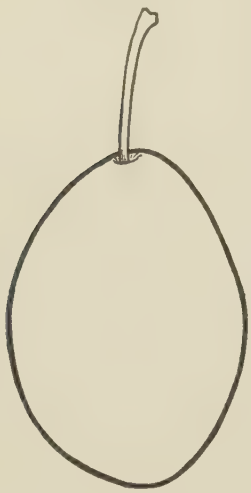
Tree vigorous, productive, rather tender to cold, healthy, remarkable as blooming very late. Fruit mid-season, very large, oval, slightly cordate; suture shallow but distinct; cavity medium in depth, broad, abrupt; skin dark red on a yellow background; flesh yellow, firm, sweet, aromatic, with a very distinct, characteristic flavor; quality good to very good; stone remarkable for its small size, pointed, oval, plump, clinging somewhat.

GEORGESON. *P. salicina. Mikado. Normand. White Kelsey.* The rich yellow fruit is a particularly handsome plum, but here praise ends. The flesh is so astringent and clings so tenaciously to the stone as to make the variety unfit for either dessert or culinary use. Moreover, the fruits are exceedingly variable in color, size, and shape, in the last character ranging from flattish to round, with sometimes round and sometimes pointed apex. The tree has too much of the sprawling habit of Burbank to make it a good orchard plant. Georgeson was brought to notice by J. L. Normand, Marksville, Louisiana, about 1889.

Tree medium in size and vigor, upright-spreading, not always hardy, productive. Leaves broadly oblanceolate, 1½ inches wide, 3¾ inches long, thin; margin crenate or serrate, with small, amber glands; petiole ⅝ inch long, reddish, with 1-10 brownish-red glands; blooming season early. Fruit early; 1⅝ inches in diameter, round-cordate; cavity deep, wide, usually with concentric, russet lines; color greenish-yellow, changing to deep yellow as the fruit reaches full maturity; bloom thin; flesh golden-yellow, fibrous, firm, sweet except near the center; fair to good; stone clinging, oval, turgid, with pitted surfaces.

GERMAN PRUNE. Fig. 192. *P. domestica.* German Prune is one of the oldest plums under cultivation, and is still as largely grown, the world over, as any. Undoubtedly its wide distribution is due somewhat to its many variations. The variety comes almost true to seed, and is often propagated by planting pits, a practice which has produced many strains. The most commonly grown German Prune in the United States is the Rochester strain, trees from which the description which follows was made. Another German Prune is the Dansville strain grown in the nurseries of Dansville, New York. Still

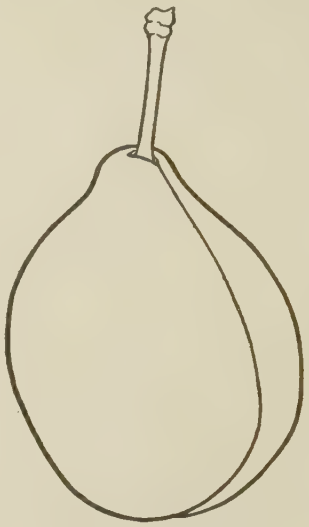
another of these plums is the Weedsport German Prune, so like the Rochester type as to be hardly worth distinguishing. Latz is another distinct strain; it is larger, thicker, and broader than the type here described, and is more of a clingstone. All of these German Prunes are characterized by large, hardy, vigorous, healthy, productive trees, characters so marked that one can say at once that it is the tree that gives the German Prune its great value. The fruit is excellent for all culinary purposes, especially for canning, and cures into a small but very good, tart, meaty, freestone, elastic prune. The chief objection to the plum for these purposes is that the fruits run small. This variety is likely to remain a standard for some time, but will eventually be superseded by one having a larger fruit. German writers say that this variety originated in Asia, whence it was brought during the Crusades to Europe.



192. German Prune. (×1)

Tree large, vigorous, round, dense-topped, hardy, very productive. Leaves obovate, 1½ inches wide, 3 inches long, thin, velvety; apex abruptly pointed or acute; base acute; margin finely serrate, with small glands; petiole ½ inch long, pubescent, tinged with red, glandless or with 1 or 2 small, globose glands. Flowers 1 inch across, inconspicuous on account of their greenish-yellow color, which characterizes the variety. Fruit late, ripening period very long; 1⅝ by 1 inch, oval, swollen on the ventral side, halves unequal; cavity very shallow, narrow, flaring; suture a faint line; apex pointed; color purplish-black; bloom thick; dots numerous, small, brown, inconspicuous, clustered about the base; stem ⅝ inch long, adhering well to the fruit; flesh yellowish-green, juicy, firm, sweet, mild, with pleasant flavor; good to very good; stone free, flattened, obliquely long-oval, pointed at the apex and base, with rough and pitted surfaces.

GIANT. Fig. 193. *P. domestica. Giant Prune.* The fruit of Giant is distinguished by large size and attractive color. Unfortunately, it is inferior in quality, a disappointment to all, for with Agen as a parent of the variety, high quality was to be expected. In quality, as in all fruit-characters, Giant resembles the male parent, Pond. The flesh is coarse, fibrous, lacking in juice, clings more or less to the stone, and rots quickly. The trees lack somewhat in both vigor and productiveness. Introduced as a prune, it was supposed that this variety would prove a great boon to prunemakers, but it does not cure well and is now hardly used for drying. It is unfortunate that a plum so attractive cannot be recommended, but it is doubtful whether it is worth planting on a commercial scale. Giant was grown by Luther Burbank, Santa Rosa, California. Stock was first offered for sale in 1893.



193. Giant. (×1)

Tree medium in size and vigor, round, dense-topped, hardy, productive. Leaves obovate, 2¼ inches wide, 3¾ inches long; apex abruptly pointed; margin serrate or crenate, with small, dark glands; petiole ¾ inch long, tinged red along one side, sparingly pubescent, glandless or with 1-4 greenish-brown glands. Flowers 1¼ inches across. Fruit midseason; 2 by 1½ inches, obovate, slightly necked, compressed, halves unequal; cavity shallow, narrow, abrupt; suture shallow; apex roundish or depressed; color purplish-red; bloom thin; dots numerous, small, russet, inconspicuous; stem 1 inch long, thinly pubescent, adhering to the fruit; flesh light golden-yellow, coarse, fibrous, firm, sweet, mild; fair in quality; stone semi-clinging, long-oval, flattened, with rough and pitted surfaces.

GOLDEN BEAUTY. *P. hortulana. Honey Drop. Missouri Apricot.* Golden Beauty is of little value. The plums are so small and the quality so poor that the variety is not worth planting. It is true that the firm, juicy fruits are very good for table use, in jellies in particular, and that they may be shipped long distances; but these characters cannot offset the handicap of small size and poor quality. Golden Beauty was found wild by a German on the Colorado River in western Texas during the Civil War.

Tree medium in size, vigorous, irregular in habit, spreading, low, dense, hardy, variable in productiveness. Leaves folded upward, narrowly oval, 1⅞ inches wide, 4 inches long, thin; margin irregularly and doubly crenate, with small, dark brown glands; petiole ⅞ inch long, slender, green, glandless or with 1-8 very small, globose, blackish glands. Flowers ⅞ inch across, white, blooming season late. Fruit very late; 1 inch in diameter, round, compressed, halves equal; cavity shallow, narrow, flaring; suture a line; apex round; color orange-yellow, mottled, overspread with thin bloom; dots characteristic, numerous, large and small, yellowish, conspicuous, producing a mottled appearance, clustered about the apex; stem very slender, ⅝ inch in length, glabrous, adhering to the pulp; flesh golden-yellow, juicy, coarse, fibrous, tender, mildly sweet, with

a faint apricot flavor, somewhat acid when cooked; fair in quality; stone adhering, turgid, oval, abruptly pointed at the base and apex, smooth and with a coating of yellowish-brown, cottony substance.

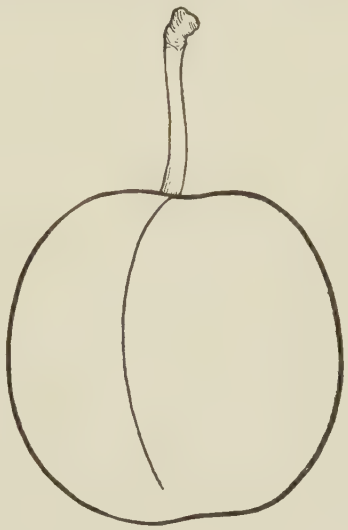
GOLDEN CHERRY. *P. cerasifera. Market Plum. Youngken Golden.* This plum is one of the few cultivated representatives of *P. cerasifera.* It offers some attractions because of real merit, and because it adds variety to the list of plums for fruit-growers. Some of its qualities are strongly marked, and the variety might prove of value in plant-breeding. Golden Cherry originated with Samuel Reeves, Salem, New Jersey, as a seedling of Myrobalan, in the early part of the last century.

Tree large, vigorous, spreading, dense-topped, unproductive; branches slender, sparingly thorny. Leaves oval, 1 inch wide, 2 inches long; margin finely serrate, with few small glands; petiole reddish, eglandular; blooming season early. Flowers well distributed on lateral buds and spurs. Fruit very early; 1¼ inches in diameter, greenish-yellow, changing to pale yellow with a tinge of red, overspread with thin bloom; flesh pale yellow, very juicy, melting, sweet next to the skin but rather tart at the pit; aromatic; good. Stone clinging, oval, with a nearly smooth surface.

GOLDEN DROP. *P. domestica. Coe's Golden Drop. Golden Gage. Silver Prune.* Well grown, this variety produces the largest, handsomest, and best of the yellow plums; but in many regions, even in the hands of the most careful growers, the trees do not reach perfection. Thus, in eastern America, trees of Golden Drop lack vigor; and, while hardy, the fruit-buds are often caught by cold; they are slow in growth; and have a precarious existence because of insects and diseases. The fruits need a long season to reach perfect maturity, often failing to ripen where other plums mature well; they are used for all purposes to which plums are put—for dessert, cooking, canning, preserving, and prune-making. For the last named purpose, the product of Golden Drop is unsurpassed for a light-colored prune. The crop, when carefully picked and handled, keeps for a month or more, shrivelling somewhat, but retaining its flavor and pleasing flesh-characters. Jervaise Coe, St. Edmunds, Suffolk, England, raised Golden Drop from a seed about 1809.

Tree medium to large, vigorous, spreading or roundish, open-topped, hardy, productive. Leaves oval or obovate, 1⅜ inches wide, 2¾ inches long, thick; apex abruptly pointed or acute; base acute; margin serrate, eglandular or with small dark glands; petiole ½ inch long, pubescent, tinged red, with 2-3 globose, greenish-yellow glands. Season of bloom medium; flowers 1 inch across, white. Fruit very late; 2 by 1½ inches in size, oval, tapering at the base to a short neck, compressed, halves equal; cavity shallow, narrow, abrupt; suture shallow and wide; apex depressed; color golden-yellow with thin bloom; dots numerous, small, russet, conspicuous; stem ¾ inch long; skin tough, adherent; flesh light golden-yellow, juicy, sweet, mild; good to very good; stone free, oval or ovate.

GOLIATH. Fig. 194. *P. domestica. Caledonia Emperor. Steers' Emperor. Wilmot's Late Orleans.* This old English plum has never been popular in America, and is now scarcely known on this continent. The fruit is large and handsome, but seldom fit for dessert. "Seldom fit" because it is variable in quality in some seasons and under some conditions. It is an excellent culinary plum, and its firm, thick, meaty flesh fits it well for shipping. The trees behave well in all respects, and usually bear full crops of plums that would tempt purchasers in any market. It has



194. Goliath. (×1)

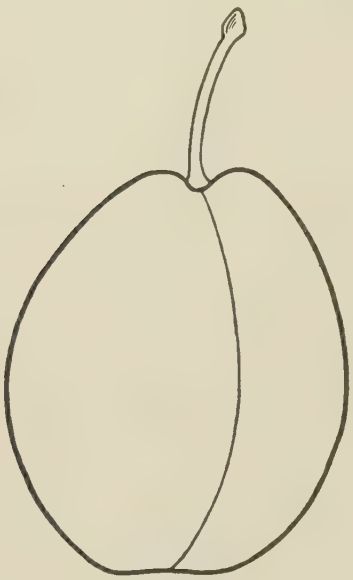
all of the characters usually ascribed to a money-making variety of any fruit, and why not more grown in commercial orchards cannot be said. Nothing is known of the origin of this plum except that it came from England about a hundred years ago.

Tree large, vigorous, round-topped, dense, hardy, very productive. Leaves obovate, 2 inches wide, 3⅝ inches long; margin finely serrate, eglandular or with few, small dark glands; petiole ½ inch long, thick, heavily pubescent, glandless or with from 1 to 3 large, globose glands. Flowers 1 inch across, white, borne on lateral spurs, singly or in pairs. Fruit midseason, ripening period short; 1⅝ inches by 1½ inches in size, round-oblong, somewhat oblique, truncate, compressed, halves unequal; cavity narrow, abrupt, russeted; suture a line; apex depressed; color dark purplish-red, overspread with thick bloom; dots characteristic, numerous, russet, conspicuous; stem thick, ¾ inch long, thickly pubescent, adhering well to the fruit; skin thin, sour, separating readily; flesh golden-yellow, dry, firm, sweet; fair to good; stone free, round-oval, flattened, blunt at the base and apex, roughened and irregularly furrowed.

GONZALES. *P. salicina* × *? Red Gold.* Gonzales is a promising plum for the South. It is a chance seedling found in Gonzales, Texas, about 1894, and was introduced by F. T. Ramsey, Austin, Texas, in 1897. It is the product of some Japanese variety pollinated by a native. The following description is compiled:

Tree vigorous, upright-spreading, open; leaves narrow, oval, tapering at both ends; upper surface glabrous; margin minutely glandular, finely crenulate; petiole short and slender, with 2 glands. Fruit midseason; resembles Burbank in size and shape; skin toughish; color bright red, sometimes striped and splashed with dark red; flesh yellow, tinged red, firm, sweet; good; stone of medium size, oval, clinging.

GRAND DUKE. Fig. 195. *P. domestica.* Grand Duke is the favorite late-shipping plum in eastern America. Its popularity is due to large size, the true prune shape, which seems most pleasing in the markets, handsome plum-purple color, and firm, meaty flesh, which fits the fruits excellently for shipping. The plum is not more than a second-rate dessert fruit, although it is very good in whatever way cooked. The trees grow poorly in the nursery,

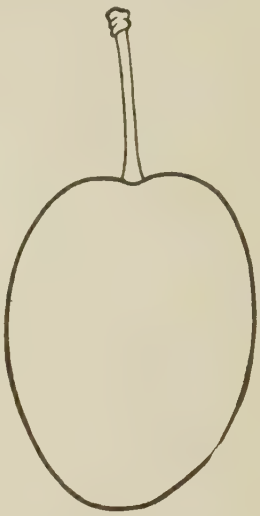


195. Grand Duke. (×1)

and in the orchard are seldom large and vigorous enough to be called first class; they come in bearing slowly, but bear regularly and abundantly and hold the crop well, the plums being unusually free from rot and hanging in good condition a long time. Grand Duke deserves its popularity as a market plum; probably no better variety can be selected for the last of the season. Grand Duke is another of the many valuable plums produced by Thomas Rivers, Sawbridgeworth, England.

Tree medium in size, vigorous, upright-spreading, hardy, productive. Leaves flat, obovate, 1½ inches wide, 3 inches long, thick; apex taper-pointed; base acute; margin serrate, with small, dark glands; petiole ¾ inch long, nearly glabrous, with 1-3 globose, yellowish glands. Blooming season intermediate; flowers 1 inch across, white. Fruit late; 2½ by 2 inches in size, elongated-oval or slightly obovate, halves unequal; cavity shallow, narrow, abrupt; suture wide; apex flattened, depressed or with a short, blunt tip; color purplish-black, with thick bloom; dots numerous, small, brown; stem ¾ inch long; skin separating readily; flesh golden-yellow, juicy, firm, sweet, mild; good; stone clinging, sometimes tinged red, irregularly oval, slightly flattened, rough.

GUEII. Fig. 196. *P. domestica. Big Blue. Blue Magnum Bonum.* Gueii ranks among the first half-dozen plums in eastern America. Its popularity is due to its being a money-maker, as few would care to grow it in a home orchard. The quality of the fruit is poor for dessert, and it cannot even be called a particularly good-looking plum. But the trees bear early and abundantly; are large, vigorous, healthy, and hardy; and the plums are hardly surpassed for shipping, especially at the time at which the crop comes upon the market, about midseason, for the best shipping plums mature a little later. The fruit is subject to brown-rot. The stone sometimes clings rather tightly, and under other conditions is wholly free. It could be wished that so popular a market plum were better in quality, but since high quality is seldom correlated in plums with fitness to ship well, it would be unfair to condemn Gueii as a market fruit because it cannot be eaten with relish out of hand. Gueii originated with a Mr. Hagaman, Lansingburgh, New York, about 1830.



196. Gueii. (×1)

Tree large, vigorous, open-topped, hardy, very productive. Leaves obovate, 2 inches wide, 4 inches long, thick; margin doubly crenate, with small black glands; petiole ⅝ inch long, thick, pubescent, tinged red. Flowers 1⅛ inches across, white. Fruit midseason; medium in size, ovate, halves equal; cavity abrupt, rarely sutured; apex bluntly pointed; color dark purplish-black, with thick bloom; dots numerous, small, russet, clustered about the apex; skin thin, tender, separating readily; flesh greenish-yellow, changing to light golden-yellow, dry, firm, tender, sweet, mild, astringent at the center; fair in quality; stone usually clinging, large, ovate or oval, blunt at the base and apex, roughened and pitted.

HALE. *P. salicina. J. Prolific.* Hale is of questionable value, failing both in fruit and tree. The flavor of the plum is good in the judgment of some, but others find it too sweet and somewhat mawkish near the skin and about the pit. All agree, however, that the flesh clings too tightly to the stone for pleasant eating, and that the texture is too tender for good shipping. But the trees fail most markedly: they are but semi-hardy; with the best of care the wood does not ripen properly; the habit of growth is not good; they are slow in coming in bearing; not regularly productive; and are readily infected by brown-rot. The fruits are much infested by curculio. Luther Burbank offered this plum under the name J, in 1893, and the following year as Prolific. J. H. Hale, South Gastonbury, Connecticut, introduced it as Hale in 1896.

Tree vasiform, open-topped, semi-hardy, variable in productiveness. Leaves sparse, oblanceolate, 1¾ inches wide, 3½ inches long, thin; apex abruptly pointed; base acute; margin finely serrate or crenate; petiole slender, tinged red, with 1-4 globose or reniform glands. Flowers white. Fruit early; 1¾ inches in diameter, round, halves equal; cavity abrupt, regular; suture a line; apex round; color light yellow, more or less blushed with red on one side, becoming red at maturity, mottled, with thin bloom; dots numerous, small, white; stem slender, ⅝ inch long, glabrous; skin thin, tough, adhering; flesh yellowish, very juicy, fibrous, tender, melting next the skin but firmer at the center, sweet except near the pit; good in quality; stone adhering, round-oval, flattened, blunt but with a small, sharp tip, rough.

HAMMER. *P. americana.* The trees of this variety make the best orchard plants of all of the native varieties, being large, vigorous, shapely, and hardy. The fruits are good in quality, handsome in appearance, keep and ship well, but crack badly in unfavorable weather, and are quite subject to brown-rot. Hammer extends the season of the Americana plums considerably, and is well worth planting in home orchards, in which the native plums are too seldom found. In particular, this variety can be recommended for the colder parts of the country where Domestica and Insititia plums are not hardy. Hammer is one of H. A. Terry's numerous plums, fruited first in 1888.

Tree very large, vigorous, round-topped, spreading, hardy, an uncertain bearer. Leaves oval or obovate, 2 inches wide, 4 inches long, thin; apex taper-pointed; base obtuse; margin coarsely and doubly serrate; petiole ¾ inch long, tinged red, with 1-4 small, globose, greenish-brown glands. Flowers 1⅝ inch across, white, with a disagreeable odor. Fruit midseason; 1¼ inches in diameter, round-oval, compressed, halves equal; cavity very shallow, narrow, flaring; suture an indistinct line; apex roundish; color crimson with thick bloom; dots numerous, very small, light russet; stem slender, ⅝ inch long, glabrous; skin thick, tough, inclined to crack, separating readily; flesh golden-yellow, juicy, fibrous, tender, melting, sweet, aromatic; good; stone semi-free, flattened, round-oval, compressed at the base; abruptly pointed at the apex, rough.

HAND. *P. domestica. General Hand.* Unproductiveness and uncertainty in bearing keep this variety from being one of the best of all plums in America. Even with these handicaps, it has maintained its popularity for a century. The fruit is the largest of the Reine Claude plums—a beautiful golden-yellow truncated sphere—and when allowed to become fully ripe is unsurpassed in flavor—pleasing in all the flesh attributes of a good dessert plum. The trees, in vigor, health, and hardiness, are usually satisfactory, but are unproductive. The amateur should plant this variety, and it would seem that it is more often worth planting in commercial orchards. The original tree grew on the place of General Hand, Lancaster, Pennsylvania, and first fruited about 1790.

Tree large, vigorous, spreading, dense-topped, hardy, variable in productiveness. Leaves obovate or oval, 2½ inches wide, 4½ inches long; apex and base acute; margin finely and doubly serrate; petiole ¾ inch long, pubescent, tinged red, with 1-4 small, globose, greenish-brown glands. Flowers 1¼ inches across, white. Fruit midseason; 1¾ inches in diameter, round-truncate, halves equal; cavity deep, flaring; suture shallow, distinct; apex flattened or depressed; color yellow, obscurely striped and mottled with green, with thin bloom; dots numerous, white, inconspicuous, clustered about the apex; stem long, very pubescent; skin thick, tough, astringent, separating readily; flesh golden-yellow, juicy, fibrous, firm, sweet, pleasant; very good; stone free, broadly oval, turgid, blunt at the base and apex, roughened.

HANSKA. *P. americana* × *P. Simonii.* Hanska is a cross between *P. americana* and a large, firm-fleshed apricot-plum from China. The tree is said to make an extraordinarily rapid growth in the nursery and to fruit on two and three-year-old wood in the nursery row. The fruits closely resemble those of the Chinese parent in color, fragrance, quality, and firmness of flesh, but are smaller in size. The pit is very small. The variety originated with N. E. Hansen of the South Dakota Experiment Station, and first fruited in 1906 on two-year-old trees. The variety is planted only in the northern states of the Great Plains.

HAWKEYE. *P. americana.* This variety is a widely planted Americana. It is typical of its species; its foliage, fruit, and pit all represent *P. americana* very well. The fruit is satisfactory, both attractive in appearance and pleasant to eat out of hand or cooked. The trees are crooked in body and quite too straggling, and, at the same time, too dense in growth to make good orchard plants. This variety belongs in the Middle West, but it might be grown for home use in regions too cold for the European plums. Hawkeye is a seedling of Quaker grown by H. A. Terry, Crescent, Iowa, and introduced in 1883.

Tree large, vigorous, spreading, low-headed, hardy, productive, susceptible to attacks of shot-hole fungus. Leaves tinged red late in the season, flat, obovate, 2 inches wide, 4 inches long, thin; apex taper-pointed; base very abrupt; margin coarsely and doubly serrate, the serrations often becoming spiny, eglandular; petiole slender, ½ inch in length, pink, with 1 or 2 globose, greenish-brown glands. Flowers showy on account of the numerous, pure white, flat petals, with a somewhat disagreeable odor. Fruit midseason; 1 inch in diameter, round-oval, halves equal; cavity shallow, narrow; suture an indistinct line; apex round; color dull carmine, with thin bloom; dots numerous, gray or reddish, obscure; stem slender; skin thick, tough, adhering; flesh pale, dull yellow, very juicy, fibrous, watery and melting, sweet at first with a tart and astringent after-taste; good; stone adhering to the pulp, round-oval, flattened, smooth.

HUDSON. *P. domestica. Hudson River Purple. Purple Egg.* Hudson belongs to the Hudson River Valley, New York, where it has long been grown for home and market. The variety has few qualities of fruit to commend it, since the fruits are of only medium size, not markedly attractive in appearance, and the quality is below the average. The trees are very good in habit of growth and bear very well; they have the faults of not bearing early and of being subject to black-knot. Nothing is known of the origin of Hudson except that it has been grown in the Hudson River Valley for many years.

Tree large, vigorous, spreading, very productive, hardy. Leaves oval, 2 inches wide, 3¾ inches long; apex acute; base abrupt; margin serrate, with small dark glands; petiole ⅝ inch long, thick, lightly pubescent, glandless or with 1-3 greenish-yellow glands. Flowers 1 inch across, white. Fruit late; 1½ inches in diameter, long-oval, halves unequal; cavity shallow,

narrow, abrupt, regular; suture shallow; color purplish-black, with thick bloom; dots numerous, small, russet; stem slender, 1 inch long; skin thin, tender, separating readily; flesh golden-yellow, juicy, tender, sweet next the skin, sour towards the center, aromatic; good; stone sometimes reddish, ovate, roughened, acute at the base and apex.

HULINGS. *P. domestica. Keyser's Plum.* Hulings is one of the Reine Claude group, and typical of the remarkably fine varieties of that group in every respect. The plums are particularly agreeable to the taste because of sprightliness, which many plums of its type lack. The trees are satisfactory, so that the variety has much to recommend it for commercial plantations. Hulings originated early in the last century with a Mr. Keyser of Pennsylvania, who grew it from seed; W. E. Hulings of the same state brought it to public notice.

Tree large, vigorous, upright-spreading, dense-topped, productive. Leaves unusually large, obovate, 3 inches wide, 6½ inches long, thick, leathery, rugose; margin crenate or serrate; petiole thick, tinged red, pubescent, with 1-3 globose glands. Fruit maturing in midseason; about 2 inches in diameter, round, dull greenish-yellow, overspread with thin bloom; skin thin, somewhat sour; flesh greenish, firm but tender, sprightly; good to very good; stone broad-oval, medium turgid, with short, thick, slightly oblique apex.

HUNGARIAN. *P. domestica. Date Plum. Hungarian Prune.* This plum may be a descendant of a species distinct from *P. domestica.* It differs in habit of growth, the leaves are smaller, distinctly folded, and droop. But it is the fruit that differs most; fruit and stone are more elongated than in other European varieties, and the stone is larger, flatter, more pitted, and more pointed at the base and apex. It is doubtful whether Hungarian is worth cultivating in America, though the plum is larger than that of the commonly grown German Prune, and is fully equal if not better in quality; but its type is unknown and consumers hesitate to buy the unknown. Nothing is known of the history of this plum except that it has been long under cultivation, and that it came from Hungary.

Tree large, vigorous, upright-spreading, dense-topped, hardy, productive. Leaves drooping, obovate, 1½ inches wide, 3¾ inches long, thick; apex and base acute; margin serrate, with small brown glands; petiole ½ inch long, pubescent, tinged red, glandless or with 1 or 2 globose, greenish-yellow glands. Flowers 1 inch across, the buds tinged yellow, changing to white on opening. Fruit late; 1½ by 1 inch in size, oblong, necked, swollen on the suture side, compressed, halves unequal; cavity very shallow and narrow, abrupt; suture shallow; apex pointed; color dark reddish-purple, with thick bloom; dots numerous, small, russet; stem slender, 1 inch long, pubescent; skin thin, tough, sour, separating readily; flesh yellowish-green, juicy, firm but tender, sweet, mild; good to very good; stone semi-free to free, long-oval, flattened, necked at the base, acute at the apex, with thickly pitted surfaces.

ICKWORTH. *P. domestica. Ickworth Imperatrice.* Ickworth is hardly known in America, but in England it is a favorite late plum, noted as being one of the best of all plums for late keeping. The plums are too small for the market, and are not high enough in quality for a home plum; moreover, they do not always ripen in northern latitudes. In California, Ickworth has been found to make a very good prune and to ship very well in the green state, but here, also, small size debars it from great commercial value. The tree characters of Ickworth are all good. Knight, the noted English pomologist, raised this plum early in the last century.

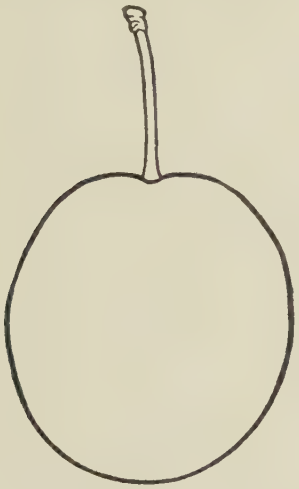
Tree large, vigorous, upright-spreading, hardy, productive. Leaves oval, 1½ inches wide, 3 inches long, thick, leathery; apex abruptly pointed or acute, base acute; margin crenate, with small dark glands; petiole ½ inch long, thick, greenish, glandless or with 1-4 large, reniform or globose, yellowish-brown glands. Flowers 1 inch across, white. Fruit very late; 1½ by 1¼ inches in size, oval, sometimes compressed, halves unequal; cavity shallow, narrow, abrupt; suture shallow, wide; apex one-sided, depressed; color purplish-black, mottled, with thick bloom, dots numerous, very small; stem 1 inch long, pubescent; skin thick, tender, adhering; flesh dull yellowish, juicy, sweet, mild, pleasant; good; stone usually clinging, irregularly oval, flattened, faintly pitted, acute at the base, blunt at the apex.

IMPERIAL EPINEUSE. *P. domestica. Clairac Mammoth.* The fruits of Imperial Epineuse are not surpassed in quality by those of any other plum; moreover, they are most pleasing in appearance, being large, beautiful in shape, and made further attractive by a handsome reddish-purple color which is lighter or darker according to the exposure to the sun. The tree-characters are exceptionally good; the crop is so borne on the main limbs as to be protected from the sun; and the tree is particularly large and vigorous, its strong growth being a striking characteristic of the variety. The variety is much grown in California, and should be grown in all plum-regions. Wherever tried in the East, fruit and tree are liked, and the variety is certain to grow in popularity in eastern orchards for both home and market plantations. Imperial Epineuse was found about 1870 near Clairac, in the great prune district of France. It was brought to the United States by Felix Gillett, Nevada City, California, in 1883.

Tree large, vigorous, spreading, productive. Leaves obovate, 1¾ inches wide, 3½ inches long, thick, rugose, glabrous except along the deep and widely grooved midrib; petiole 1 inch long, tinged red, glandless or with 1-3 globose glands. Flowers 1 inch across. Fruit late; large, obovate, purplish-red, darker on the sunny side, mottled, overspread with thick bloom; flesh greenish-yellow, fibrous, tender, sweet, agreeable in flavor; very good; stone clinging, irregular-oval, flattened, obliquely but bluntly contracted at the base, with pitted surfaces.

IMPERIAL GAGE. Fig. 197. *P. domestica. Flushing Gage. Prince's Gage. Superior Green Gage. White Gage.* There is much contradictory evidence as to the value of Imperial Gage. The fruits are said in some of the fruit-books to be the largest of all the Reine Claude plums, and in others to be too small to be desirable; in some, they are said to be of highest quality, and in others quite too insipid to be called a dessert fruit. These contradictions have arisen because the variety grows quite differently in different soils. Imperial Gage is best adapted to light sandy soils; the fruits grow largest and best in quality on such soils, and make the poorest show of all

on heavy clays. The trees are nearly perfect in habits of growth—vigorous, hardy, healthy, and bear large crops of plums. The product is adapted alike for dessert, canning, home,

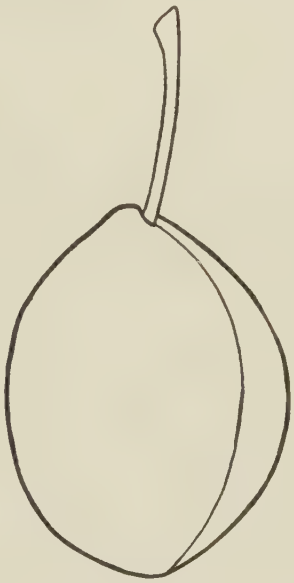


197. Imperial Gage. (×1)

and market. In selected locations, Imperial Gage is a most valuable fruit. The Princes in their nursery at Flushing, Long Island, about the year 1790, planted the pits of twenty-five quarts of the Green Gage plum, and from one of these produced Imperial Gage.

Tree large, vigorous, upright-spreading, open-topped, hardy, very productive. Leaves obovate, 2 inches wide, 3 inches long, thick; apex pointed; base acute; margin crenate, with small dark glands; petiole ½ inch long, thick, glandless or with 1 or 2 small, globose, yellowish-green glands. Flowers 1 inch across, white. Fruit midseason; 1½ inches in diameter, ovate, compressed, halves equal; cavity shallow, narrow, abrupt; suture a line; apex depressed; color dull greenish-yellow, with obscure green streaks, mottled and faintly tinged red on the sunny side, with thick bloom; dots numerous, small, grayish, obscure; stem ¾ inch long, pubescent; skin thin, tender, separating readily; flesh golden-yellow, juicy, firm, tender, sweet, mild; good to very good; stone free, oval, flattened, with pitted surfaces, blunt at the base, very blunt at the apex.

ITALIAN PRUNE. Fig. 198. *P. domestica. Fellenberg.* Italian Prune is grown in all of the plum regions of continental Europe; is well known in England; is third or fourth in popularity in the Atlantic states of America; is the leading plum in the Pacific Northwest, where it is chiefly used in prune-making; and is grown somewhat for prunes and for shipping green in California. The fruit is finely flavored, whether eaten out of hand, prepared for the table, or cured as a prune. While a little too tart to be ranked as a first-rate dessert plum, it is one of the best of the prunes for this purpose, though it must be fully ripe to be fit for dessert. In cooking, the yellow flesh changes to a dark wine color, very attractive in appearance, with a most pleasant, sprightly flavor; as a cured prune, the flesh is firm and meaty, yet elastic, of good color and a perfect freestone, making when cooked the same attractive-looking, finely-flavored, sprightly sauce as is to be had from the green fruits. The prunes from this variety, also, are noted for long-keeping. In the uncured state, the product keeps and ships well. The trees are large, hardy, productive, well-formed, and bear regularly; yet they are not ideal, and the variety fails chiefly in tree-characters. The trees are often capricious to soil and climate, do not always bear well, seem to be susceptible to diseases, are preyed upon by insects, and suffer in particular from dry or hot weather. Italian Prune originated in Italy at least a century ago, and has long been common in northern Italy, especially in the vicinity of Milan.

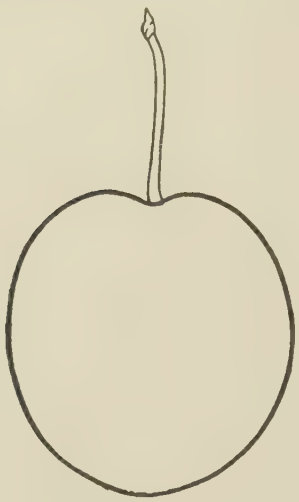


198. Italian Prune. (×1)

Tree vigorous, upright, low-topped, hardy, productive. Leaves oval, 2 inches wide, 4½ inches long; apex and base acute; margin doubly crenate, with small, dark glands; petiole ⅝ inch long, thick, pubescent, tinged red, with 1-3 globose, greenish-brown glands. Flowers 1¼ inches across, white. Fruit late; 2 by 1½ inches in size, long-oval, enlarged on the suture side, compressed, halves unequal; cavity very shallow and narrow, abrupt; suture shallow; apex bluntly pointed; color purplish-black, with very thick bloom; dots numerous, small, light brown, conspicuous; stem inserted at one side of the base, 1 inch in length, pubescent; skin thin, tough; flesh yellow, juicy, firm, subacid, aromatic; very good to best; stone free, irregular-oval, flattened, roughened and pitted, necked at the base, abruptly tipped at the apex.

JEFFERSON. Fig. 199. *P. domestica.* Jefferson has long been popular in America. Its popularity is waning, however, chiefly because it is lacking in the essentials demanded of a market fruit. There can be no question of the standing of Jefferson as to quality of fruit—it is one of the best of all dessert plums. Grown under favorable conditions and when fully ripe, the plum is golden-yellow with a

delicate blush and bloom, and is large for a plum in the Reine Claude group. It fails as a market variety because the trees are late in coming in bearing, a little particular as to soils, and not quite hardy. Both tree and



199. Jefferson. (×1)

fruit are too delicate for market-growers and market-men. As to its value for private places, there can be no doubt—it is one of the choicest varieties. Jefferson was raised by Judge Buel, Albany, New York, about 1825.

Tree medium to large, vigorous, spreading, open-topped, hardy, productive. Leaves obovate, 1¾ inches wide, 3¾ inches long, thick; apex and base acute; margin serrate, with small, dark glands; petiole ¾ inch long, tinged purplish-red along one side, with 1-3 small, yellowish glands. Flowers 1 inch across, white. Fruit midseason; 1½ inches in diameter, round-oval, halves equal; cavity shallow, narrow, abrupt; suture very shallow, indistinct; apex round; color bronze-yellow, sometimes with faint pink blush on the exposed cheek; dots numerous, very small, gray or reddish; stem 1 inch long, thinly pubescent; skin thin, tough, adhering; flesh deep yellow, juicy, firm but tender, sweet, pleasant; very good; stone semi-free, flattened, broadly oval, abruptly tipped, with a short neck at the base, blunt at the apex, with rough and pitted surfaces.

KELSEY. *P. salicina. Botankin. Hattankio. Kelsey's Japan. Smomo. Togari.* This variety is not much hardier than the fig, and cannot be safely planted north of Washington and Baltimore. The tree is vigorous, well formed, and productive, having for its worst fault susceptibility to shot-hole fungus. The plums are large, very attractive in color; and the flesh is firm, with a rich, pleasant, aromatic flavor, making the fruit very good in quality. In the South, both curculio and brown-rot attack the fruits rather badly. Kelsey, the first of the Japanese plums introduced into America, was brought into the country by a Mr. Hough, Vacaville, California, in 1870. John Kelsey, Berkeley, California, obtained trees from Hough and propagated it. The following description is compiled:

Tree vigorous, upright, vasiform, tender, productive, an early and regular bearer. Leaves somewhat scant, small, lanceolate, narrow; blooming season early. Fruit very late, season long, keeps and ships well; large, cordate, conical, halves unequal; suture variable in depth; apex pointed; color rather unattractive yellow, tinged and splashed with red, often overspread with purple, with attractive bloom, more or less marked with conspicuous dots; stem sometimes adhering poorly to the fruit; skin tender; flesh delicate yellow, juicy, firm and meaty, rich, pleasant, aromatic; good to very good; stone clinging unless well ripened, small, in an irregular cavity larger than the pit.

KING. *P. insititia.* The fruit of King runs large for a Damson, and the flavor is agreeable, so agreeable that the variety is a very good dessert fruit late in the season. This Damson is little grown in America and deserves much wider cultivation. A peculiarity of the flower is that there is always more or less doubling of the petals. Very little is known regarding the history of this excellent variety, but it seems probable that it originated in Kent, England, where it is much grown.

Tree small, lacking in vigor, upright-spreading, dense-topped, productive. Leaves obovate, 1 inch wide, 2¾ inches long; margin serrate, usually with small dark glands; petiole with 1 or 2 glands on the stalk. Flowers usually with more than 5 petals, 1 inch across, white with a yellow tinge at the apex. Fruit late, season long; 1 inch in diameter, oval, slightly necked, black, with thick bloom; flesh greenish-yellow, juicy, firm, sprightly, becoming sweet late in the season; of good quality; stone clinging, irregular-ovate, slightly necked.

LATE MIRABELLE. *P. insititia.* In France, where all of the Mirabelles are highly esteemed, Late Mirabelle is much grown. The variety is practically unknown in America, but well deserves widespread trial, as do all the Mirabelles. The history of this variety is unknown other than that it is an old sort, having been mentioned in the London Horticultural Society catalog as long ago as 1831.

Tree medium in size and vigor, very hardy, productive; branches smooth. Leaves small, oval, 1¼ inches wide, 2 inches long; margin finely serrate, with few, dark glands; petiole slender, glandless or with 1 or 2 glands at the base of the leaf. Fruit late; small, round-oval, greenish-yellow, often with a light blush on the sunny side, covered with thin bloom; stem short, slender; flesh yellow, very juicy, aromatic, sweet; good; stone semi-free.

LATE MUSCATELLE. *P. domestica.* Late Muscatelle has been fruiting for fifteen years at the New York Agricultural Experiment Station, and has come to be regarded as one of the best late plums out of the 500 or more that have been fruited with it. The plums are large and somewhat truncate, of a pleasingly rotund shape; the color is a beautiful purple-brown, slightly splashed and mottled with russet; the skin is thicker and tougher than one wishes in a first-class dessert plum, but these qualities are valuable assets in shipping; the flesh is tender, meaty, firm, juicy, sweet, and delicious. A pleasing characteristic is that the flesh is about the freest from the stone of that of any plum. The crop is late to ripen and keeps well, but, if kept too long, the fruits shrivel somewhat. The trees are hardy and relatively free from insects and diseases, but are not quite so vigorous as one could wish. For home use and local market, Late Musca-

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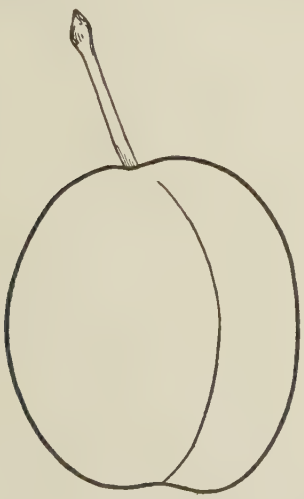
telle is certain to prove a valuable variety, and it may have a place for the general market. It is an old European sort having several synonyms in the pomologies of continental Europe.

Tree of medium size and vigor, upright-spreading, dense-topped, hardy, productive. Leaves drooping, obovate, 1½ inches wide, 3½ inches long, leathery; margin crenate, with few, small, dark glands; petiole thick, pubescent, with 1-3 glands. Flowers 1 inch across, usually in pairs. Fruit late, season short; medium to large in size, round, truncate, purplish-brown, splashed and mottled with russet about the base, overspread with thick bloom; skin rather tough, separating readily from the pulp; flesh greenish-yellow, firm, juicy, aromatic, rich, sweet; very good; stone small, free, reddish, flat, irregular-oval, with pitted surfaces.

LINCOLN. *P. domestica.* In Pennsylvania and New Jersey, Lincoln is well thought of for home use and the markets. The fruit is unusually attractive in size and color, and for quality it may be named among the best of the red plums. Unfortunately, the variety is readily infected by the brown-rot, which, when epidemic, cannot be controlled. This plum originated in York County, Pennsylvania, soon after the Civil War, supposedly from seed of Reine Claude.

Tree of medium size, vigorous, upright-spreading, dense-topped, hardy, productive. Leaves obovate, 2 inches wide, 4 inches long, stiff; petiole 1 inch long, pubescent, reddish, with 1-4 large, globose or reniform, yellow glands. Flowers over 1 inch across, white. Fruit early, season short; 2 by 1½ inches in size, oblong-oval, slightly necked, halves equal; cavity very shallow, narrow, abrupt; suture shallow; apex depressed; color light or dark red over a yellow ground, with thin bloom; dots numerous, small, light russet; stem 1 inch long, parting readily from the fruit; skin thick, sour, separating readily; flesh greenish-yellow, juicy, coarse and fibrous, firm but tender, sweet, pleasant; good to very good; stone free, long-oval, flattened, necked at the base, blunt at the apex, with markedly rough and deeply pitted surfaces.



200. Lombard. (×1)

LOMBARD. Fig. 200. *P. domestica.* Lombard is probably more widely grown in America than any other plum. The meritorious characters which enable it to take high place in American plum-growing are: the elasticity of its constitution, whereby it adapts itself to widely different soils and climates; the robustness, hardiness, healthiness, productiveness, and regularity in bearing of its trees; the fact that the fruits are comparatively free from plum-curculio; lastly, its showy fruits tempting to the eye and readily salable. Lombard would be preëminently the plum "for the millions" if its fruits were not so poor in quality. Canned, cooked, preserved, or spiced, the product does very well, but as a dessert fruit, Lombard falls in a category with the Ben Davis apple and Kieffer pear, "good-looking but poor." Lombard was raised by Judge Platt, Whitesboro, New York, about 1830. Several varieties, as Communia, Tatge, Spanish King, and Odell, are very similar, if not identical with Lombard.

Tree of medium size, round-topped, very hardy, productive. Leaves long-obovate, 1½ inches wide, 3½ inches long, thick; apex acute; base tapering; margin often doubly serrate, with small, dark glands; petiole ½ inch long, thick, tinged red, pubescent, with 1 or 2 globose, yellowish-green glands. Flowers 1 inch across, white. Fruit midseason; 1¾ by 1½ inches in size, round-oval, compressed, halves unequal; cavity narrow, abrupt, round; suture a line, apex flattened; color light to dark purplish-red, overspread with thick bloom; dots numerous, small, light russet; stem slender, ¾ inch long; skin thin, tender, separating readily; flesh yellow, juicy, fibrous, firm and sweet, mild; inferior in quality; stone semi-free to free, dark colored, oval, flattened, roughened.

McLAUGHLIN. *P. domestica.* The fruits of McLaughlin stand well up with the best plums in quality, and when well grown are very attractive in appearance. The flavor is rich and delicate, and has a savor quite its own; there are few other plums in which the characters pleasing to the taste exist in such nice proportions. The fruit is a little smaller than that of some other sorts of its group, but is quite large enough for a dessert fruit. The fruits have imperfections, however. The flesh clings tenaciously to the stone, is too melting to keep or ship well, and rots badly on the tree. The tree is above average in size and vigor, and is as hardy as any; it comes in bearing early and is productive. The place for this plum is apparent at once—in the home orchard. McLaughlin was raised by James McLaughlin, Bangor, Maine, first fruiting about 1840.

Tree of medium size, variable in vigor, spreading, open-topped, hardy, productive. Leaves oval, 2 inches wide, 3½ inches long, thick; apex abruptly pointed; base acute; margin crenate, with small, black glands; petiole ½ inch long, thick, pubescent, tinged red, with 1 or 2 small, globose, yellow glands. Flowers 1 inch across, white, with yellow tinge near the apex of the petals. Fruit early; 1½ by 1 inch in size, round-oblate, compressed, halves equal; cavity shallow, narrow, abrupt; suture shallow; apex depressed; color greenish-yellow, blushed and mottled with red, with thick bloom; dots numerous, small, light colored; stem thick, ¾ inch long, pubescent; surrounded at the cavity by a fleshy ring; skin tough; flesh light yellow, juicy, sweet, mild and pleasant; very good; stone clinging, broad-oval, very blunt at the base and apex; heavily wrinkled and deeply pitted.

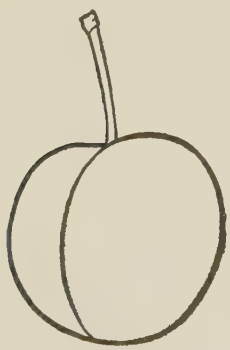
McRAE. *P. salicina.* This variety is grown only in the Gulf states and more especially in Florida, where it seems to be one of the most promising new sorts. It is said to have origi-

nated near Lake City, Florida, from seed of Kelsey, and was introduced in 1910 by the Glen St. Mary Nurseries. The fruits are described as midseason, of medium size, round, yellow washed with dull red in the sun; dots numerous; bloom thin; flesh yellow, firm, juicy, subacid; good.

MAQUOKETA. *P. hortulana Mineri.* Maquoketa is one of the best of the native plums for culinary purposes, which also keep and ship well. The trees, like those of nearly all the Miner-like plums, are better formed and more adaptable to orchard conditions than those of other native sorts. After the Americana and Nigra plums, Maquoketa is one of the hardiest of the native varieties, growing even in Minnesota. The variety belongs, however, in the South and Middle West. The origin of this plum is uncertain. It has been known to fruit-growers since about 1889.

Tree spreading, low-topped, open, hardy, productive. Leaves falling off early, broadly lanceolate, peach-like, 1¾ inches wide, 4½ inches long; apex taper-pointed; base abrupt; margin with serrations in 2 series, with very small, black glands; petiole ½ inch long, tinged with dull red, hairy, with 1-4 globose, large, dark brownish-yellow glands. Flowers 1 inch across, yellowish as the buds begin to open, changing to white, with a disagreeable odor. Fruit late; below medium in size, ovate, halves equal; cavity shallow, wide, rounded, flaring; suture a line; slightly pointed; color dark carmine, with thin bloom; dots numerous, small, clustered about the apex; stem slender, glabrous, parting readily; skin thick, tough, astringent, semi-adherent, removing a thin layer of the pulp when detached; flesh deep yellow, juicy, coarse, fibrous, sweet at first but astringent near the pit; fair in quality; stone of medium size, oval, turgid, bluntly pointed at the base and apex, with slightly roughened surfaces.

MARIANNA. Fig. 201. *P. cerasiferi* × ? Marianna has little or no value for its fruit, but is used as a stock upon which other plums are propagated. All are now agreed that this variety is from a cross-fertilized seed of *P. cerasifera,* the other parent possibly being one of the Munsoniana plums. A character peculiar to this variety is that it grows readily from cuttings; for this reason it is a cheap stock for plums of all kinds, and is used for peaches and apricots. Besides rooting readily, the plant does not sprout, and may be budded as late as the peach or later. Marianna is chiefly used in propagation in the South, and is not now employed by nurserymen anywhere so commonly as formerly. The tree is a handsome ornamental at any season of the year, and its broad, spreading top makes it a good shade tree. Marianna appeared about 1880 as a seedling in a mixed orchard belonging to Charles G. Fitze, Marianna, Texas.



201. Marianna. (×1)

Tree large, vigorous, broad, spreading, open and flat-topped, hardy, free from insects or diseases. Leaves elongated-oval, 1 inch wide, 2½ inches long, thin; apex and base acute; margin very finely serrate, with small, black or amber glands; petiole slender, ¾ inch long, tinged red, glandless or with 1-3 small, globose, greenish-brown glands. Flowers ¾ inch across, white. Fruit early; 1 inch in diameter, round-oval, halves equal; cavity shallow, narrow, abrupt, regular; suture a line; apex roundish; color bright, light red, with thin bloom; dots numerous, small, light russet, conspicuous; stem slender, ½ inch long, glabrous; skin tough, bitter, inclined to crack, parts readily; flesh yellow, tinged red, juicy, fibrous, watery and melting, sprightly; poor in quality; stone clinging, elongated-oval, blunt-pointed, surfaces pitted.

MAYNARD. *P. salicina.* The habit of the tree of Maynard is commendable, and the fruits are very acceptable to those who care for Japanese plums. The season follows that of Climax, a period when there is a dearth of plums of its type. The variety was first fruited in 1897 by Burbank, and was then sold to the Oregon Nursery Company, Salem, Oregon. It was introduced in 1903.

Tree large, vigorous, upright, open-topped, productive. Leaves obovate, 1½ inches wide, 3½ inches long, thin; margin finely serrate, with small, dark glands; petiole slender, glandless or with 1 or 2 small glands. Fruit early; 1½ inches in diameter, round-truncate, dark red, changing to purplish-black, with thick bloom; flesh red, with a tinge of yellow near the pit, fibrous, tender, melting, sweet, aromatic; good to very good; stone semi-clinging, broadly oval, turgid, blunt at the base and apex, with pitted surfaces.

MIDDLEBURG. *P. domestica.* The fruits of Middleburg may be surpassed by other plums in appearance, but few others are better in quality, whether for dessert or for cooking. They ripen late, hang well to the tree, and ship and keep well, in the latter respect equalling the best of the prunes. The trees, while of only medium size, are robust, healthy, hardy, and usually productive. Belying the looks of either fruit or tree, Middleburg improves upon acquaintance; when well known, it will be wanted in home collections, and some commercial fruit-growers will find it profitable. Middleburg originated in Schoharie County, New York, where it was found as a chance seedling.

Tree medium in size, vigorous, round and open-topped, hardy, productive. Leaves oval, 1½ inches wide, 3½ inches long, thick, stiff; apex and base acute; margin doubly serrate, with a few small, dark glands; petiole ¾ inch long, pubescent, tinged red, glandless or with 1-3 small, globose, greenish-brown glands. Flowers 1 inch across, white. Fruit very late; 1½ inches in diameter; oval, compressed, halves equal; cavity very shallow, narrow, flattened; suture lacking; apex roundish; color light to deep purplish-red, with thick bloom; dots numerous, small, russet; stem 1 inch long, thinly pubescent; skin thin, sour, separating readily; flesh light yellow, juicy, coarse, firm, sprightly, strongly aromatic; very good; stone semi-free or free, oval with pitted surfaces, slightly acute at the base and apex.

MILTON. *P. Munsoniana* × ? The special merits of Milton are that the trees bloom late and the fruit ripens early. The fruits are large, of very good quality, though a little too juicy for pleasant eating or to ship well, very attractive in appearance, and, more important than all else for the regions in which it is likely to be grown, comparatively free from rot. Unfortunately, the flesh clings most

tenaciously to the stone, even after cooking. Milton, a seedling of Wild Goose grown by H. A. Terry, Crescent, Iowa, fruited first in 1885.

Tree of medium size and vigor, round and dense-topped, hardy, productive, healthy. Leaves oblanceolate, peach-like, 1 inch wide, 3 inches long, thin; apex taper-pointed; base slightly acute; margin serrate or crenate, with numerous, minute, dark glands; petiole ½ inch long, slender, reddish, pubescent, glandless or with 1-4 small, globose, yellowish-brown glands. Flowers ¾ inch across, the buds creamy when opening, changing to white, odor disagreeable. Fruit very early; 1½ inches by 1 inch in size, oval, compressed, halves equal; cavity shallow, narrow, abrupt, regular; suture a distinct line; apex slightly pointed; color dark red, with thin bloom; dots very numerous, large, russet; stem slender, 1 inch long; skin thin, tough, astringent; flesh yellow, pulp fibrous, sweet next the skin, acid at the center; fair to good; stone adhering, long-oval, elongated at the base and apex, somewhat flattened, surface broken into irregular ridges.

MINER. *P. hortulana Mineri.* In the Middle West, Miner is probably as widely disseminated and as largely grown as any other plum, being particularly adapted to the northern limits of the cultivation of its species. The tree is robust, healthy, better in habit of growth for orchard management than that of any other of the native plums, and usually productive. The fruits are good in quality, attractive in appearance, comparatively curculio-proof, and are especially suited for culinary uses. The variety is unproductive unless cross-fertilized. In 1813, William Dodd found this plum growing in a Chicasaw Indian plantation on the Tallapoosa River, Alabama.

Tree large, vigorous, spreading, hardy, unproductive unless cross-pollinated. Leaves falling late, long-oval or obovate, peach-like, 1½ inches wide, 4 inches long, thick; apex acuminate; base abrupt and nearly acute; margin serrate, with small glands; petiole ½ inch long, often tinged red, with 2-4 reniform or globose, dark amber glands. Flowers late, medium to large. Fruit late; medium in size, round-ovate; cavity shallow, narrow, regular; suture indistinct; apex pointed; color dull, dark red, with thin bloom; dots numerous, minute, yellowish; stem slender, long, adhering strongly to the fruit; skin thick, tough, astringent; flesh pale amber yellow, juicy, tender, mild, aromatic; good; stone adhering, small, round-oval, flattened, with nearly smooth surfaces.

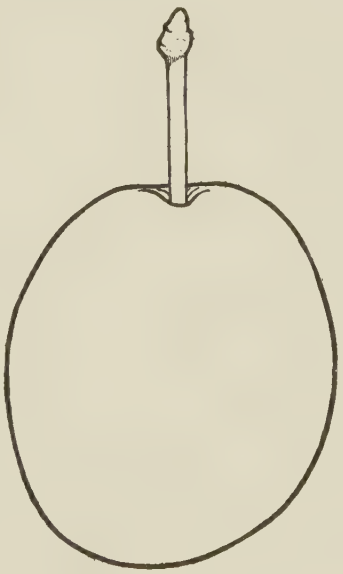
MIRABELLE. *P. insititia.* In Europe, especially in France, Mirabelle is one of the favorite varieties, and its fruits are in great demand for canning, preserves, compotes, tarts, and prunes. The trees grow very well, producing fine crops of fruit wherever the Damsons can be grown. The small, round, yellow fruits are attractive in appearance and sweet and pleasant in flavor. The trees are small but vigorous and healthy; the last two qualities suggested in Europe their use as stocks, to which purpose they are sometimes put in France when a dwarfing stock is wanted. Mirabelle was first noted by pomological writers of the seventeenth century.

Tree small, round, open-topped, hardy. Leaves falling early, 1½ inches wide, 3 inches long, oval, thin; apex acute; base abrupt; margin crenate, with small, black glands; petiole ½ inch long, tinged red along one side, glandless or with 1-3 small, globose glands. Flowers 1 inch across, white with a yellow tinge as the buds unfold. Fruit midseason; 1 inch in diameter, round-oval, necked, compressed, halves equal; cavity shallow, abrupt; suture indistinct; apex depressed, color light golden-yellow, with thick bloom; dots numerous, small, white; stem slender, ¾ inch long, pubescent, parting readily from the fruit; skin thin, tough; flesh light yellow, firm, tender, sweet, mild; good to very good; stone free, oval, blunt, broadly ridged along one edge, rough.

MIRACLE. *P. domestica.* About 1887, Luther Burbank imported from a French nurseryman a tree of a stoneless plum known as a curiosity in Europe for three centuries. With this fruit he crossed several of the best European varieties, producing hybrids which first fruited in 1893. Although there were several stoneless fruits in this lot, none was of any value and it was not until 1899 that one appeared worthy of consideration. In this seedling, developed from Agen pollen, the stone is represented by a small, hard scale near the base of the kernel. Burbank sold the new plum in 1903 to the Oregon Nursery Company, Salem, Oregon, by whom it was introduced in 1906. The following description is compiled:

Tree dwarf, producing a round, compact head, very productive. Fruit larger than Agen, oblong, dark blue covered with thick bloom; cavity medium; stem short; flesh yellow, sweet, juicy, good; stone lacking, the kernel lying naked in the flesh.

MONARCH. Fig. 202. *P. domestica.* Out of a great number of plums imported from the Old World, Monarch is one of the few which has proved worthy of a place with the best American varieties for American conditions.



202. Monarch. (×1)

The nicely turned form and the rich purple color make the fruits handsome; and, while the quality is not of the best, it is good as compared with other purple varieties, as few plums of this color are especially palatable to eat out of hand. Monarch is not remarkable

for its tree-characters, yet these average well with those of other plums, and, with those of the fruit, make a variety quite above the average, giving it a place among the best commercial sorts. Monarch was grown by Thomas Rivers, Sawbridgeworth, England, and was introduced by the originator in 1885.

Tree of medium size and vigor, upright-spreading, open-topped, hardy, productive. Leaves broadly oval, wide, thick, stiff; apex abruptly pointed; margin serrate or crenate, eglandular; petiole short, thick, heavily pubescent, tinged red, glandless or with 1 or 2 large, reniform or globose, greenish-brown glands. Flowers 1 inch across, white. Fruit late; 2 inches by 1¾ inches in size, round-oval, halves unequal; cavity deep, narrow, abrupt; suture shallow; apex flattened; color dark purplish-red, with russet flecks scattered over the surface, with thick bloom; dots numerous, small, reddish-brown, conspicuous; stem thick, ¾ inch long, pubescent; skin thin, tender, astringent, separating readily; flesh golden-yellow, juicy, fibrous, tender, aromatic; good; stone clinging, long-oval, turgid, roughened and pitted, pointed at the base, blunt at the apex.

MYROBALAN. *P. cerasifera. American Cherry Plum. Cherry. Cherry Plum. Red Mirabelle. Virginian Cherry.* Myrobalan is a group name rather than a varietal one. Plums of this group are grown from seeds, and many varieties have appeared during the last three centuries differing in color, shape, stone, and many minor characters. The strains with red and reddish-purple plums, round in shape, are apparently the most numerous, although there are frequent references to the white Myrobalan and to heart-shaped fruits in this group. For a further discussion of these plums see *P. cerasifera.* The Myrobalan plums are used largely as stocks in the propagation of plums and closely allied plants; occasionally the fruits are used for culinary purposes.

NAPLES. *P. domestica. Beauty of Naples.* Naples, although seldom found in orchards in the East, is offered by several eastern nurserymen. It is of the Yellow Egg type but far inferior to that well-known variety. It is doubtful if Naples should have a place on the list of plums for either home or commercial orchards. The variety seems to have been first described in 1892, but when, where, and by whom originated does not appear.

Tree vigorous, rather productive, hardy, healthy. Fruit ripens late, medium to large, oval; suture shallow but distinct; cavity small; skin thin, tender, golden-yellow mottled with red in the sun and more or less sun-freckled; bloom thin; flesh light yellow, firm, sweet, mild, rather insipid; quality fair to good; inferior to that of many standard plums; stone rather large, oval, round, clinging tenaciously.

NEWMAN. *P. Munsoniana.* Newman is one of the oldest, but still one of the standard varieties of its species. Its fruits are characterized by a firm, meaty flesh, which fits them well for shipping and storing; the plums are attractive also in shape and color, but are too small and too low in quality to make the variety a first-rate one. The trees are large and vigorous, and in all respects very satisfactory orchard plants. Both fruits and trees are usually reported as fairly free from diseases and insects. The origin of this plum is uncertain; it was first described in 1867.

Tree large, vigorous, spreading, low and flat, dense-topped, hardy, productive. Leaves lanceolate, peach-like, 1¼ inches wide, 4 inches long, thin; apex taper-pointed; base acute; margin finely crenate, with small, amber glands; petiole slender, 1 inch long, pubescent on one side, reddish, glandless or with 1-4 very small, globose, yellowish-red glands. Flowers ¾ inch across, tinged yellow in the buds, changing to white on expanding, odor disagreeable. Fruit midseason; 1 inch in diameter, oval, halves equal; cavity shallow, narrow, flaring; suture a dark red line; apex depressed; color bright currant-red, with thin bloom; dots grayish, conspicuous; stem slender, 1 inch long, glabrous; skin thin, very tough, astringent; flesh deep yellow, juicy, tender, melting, sweet next to the skin, tart at the center; fair in quality; stone clinging, long-oval, turgid, necked at the base, blunt-pointed at the apex, with finely pitted surfaces.

NEW ULM. *P. americana. Snooks.* New Ulm is worthy of attention because of its large, handsome, well-formed fruits, further distinguished by a peculiar flavor, suggesting that of the mandrake. The flesh is a little too juicy for pleasant eating, but the fruits ship well, as the tough, thick skin firmly holds its contents. The fruits, however, do not keep well, for, despite the thick skin, the spores of brown-rot find entrance, and the plums rot badly. The trees are hardy and productive, but ill-shaped and hard to manage in orchard or nursery, for which reason the culture of the variety is discouraged by nurserymen. New Ulm was raised by C. W. H. Heideman, New Ulm, Minnesota, about 1890.

Tree spreading and drooping, low, dense-topped, hardy, productive. Leaves drooping, oval, 2 inches wide, 4½ inches long, thin; apex taper-pointed; base abrupt; margin coarsely and doubly serrate, eglandular; petiole slender, ½ inch long, pubescent, tinged with red; glandless or with 1-3 globose, greenish-brown glands. Flowers showy on account of the numerous pure white petals, 1 inch across. Fruit midseason, 1½ inches in diameter, round-ovate; cavity shallow, very narrow; suture a line; apex pointed; color carmine over a yellow ground, with thin bloom; dots very numerous, russet; stem ½ inch long, glabrous; skin thick and tough, astringent; flesh golden-yellow, juicy, fibrous, tender and melting, sweet, with a strong aromatic flavor; good; stone adhering, oval, flattened, blunt at the base, pointed at the apex, with smooth surfaces.

OCTOBER. *P. salicina. October Purple.* October is the nearest approach to a good late plum in its species, but because of several faults falls considerably short of filling the need. The fruits are large, attractive, suitable for dessert, good for culinary purposes, hang well to the tree, and keep and ship much better than those of the average Japanese variety; but they are not far enough from mediocrity to make the variety desirable. The trees are well shaped, usually robust and healthy, and the fruit is well borne on lateral spurs distributed over the old wood; but they are tardy in coming in bearing, and cannot be depended upon to bear satisfactory crops regularly. October might be sparingly planted to the pleasure of the amateur, and to the profit of the commercial fruit-grower who has a good local market. It was first fruited by Luther Burbank in 1892.

Tree variable in size and vigor, upright-spreading, open-topped. Leaves falling early, sparse, obovate, 1⅜ inches wide, 3¼ inches long, thin, leathery; apex and base acute; margin glandular, doubly serrate or crenate; petiole ½ inch long, with 1-3 small, globose, yellowish

glands. Flowers 13/16 inch across, white. Fruit midseason, ripening period long; 1⅞ inches in diameter; round-cordate, halves unequal; cavity deep, wide, flaring, with streaks radiating from the cavity; suture a line; apex round to pointed; color dark red over a yellow-green ground, with bloom of medium thickness; dots numerous, large, russet, conspicuous, clustered about the apex; stem slender, ⅝ inch long, glabrous; skin thin, tough, sour, separating readily; flesh light yellow tinged with red, very juicy, fibrous, sweet, mild; good; stone clinging, round-oval, blunt but with a small tip, somewhat rough.

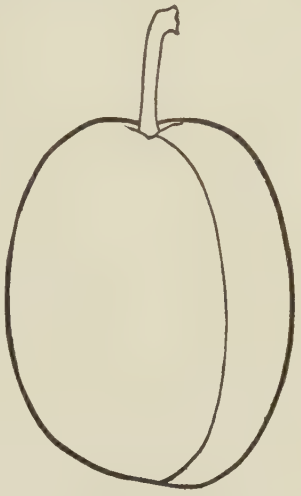
OGON. *P. salicina. Shiro Smomo. Yellow Nagate.* Ogon is one of the few varieties of *P. salicina* bearing yellow fruits. It is further distinguished by being the only freestone sort of its species under cultivation in America, and by fruits having a flavor quite distinct, resembling that of the apricot. The plums are not of high quality, crack badly on the tree, and are unusually susceptible to the attacks of curculio. The trees are small and unproductive. These faults preclude the planting of Ogon in commercial plantations. The variety is distinct and interesting not only in its fruits, but in its flowers, which bear few stamens, many of which are abortive and show all degrees between perfect stamens and perfect petals. Ogon was imported from Japan about 1885.

Tree medium, vigorous, vasiform, dense-topped, unproductive. Leaves few, oblanceolate, peach-like, 1⅛ inches wide, 4 inch long, thin; margin finely crenate, with small, dark amber glands; petiole ½ inch long, glandless or with 1-4 globose, greenish glands. Flowers 1⅜ inch across. Fruit early; 1¼ inches by 1¾ inches in size, round-oblate, oblique, halves equal; cavity narrow, regular, flaring; suture variable in depth, prominent; apex roundish or slightly flattened; color lemon-yellow, with thin bloom; dots numerous, small, white, inconspicuous; stem slender, ½ inch long, glabrous, separating readily; skin thin, rough, astringent, inclined to crack, adhering; flesh pale or amber-yellow, firm, sweet, mild; of fair quality; stone free, round-oval, turgid, blunt but with a small, short tip, oblique, slightly pitted.

OMAHA. *P. salicina* × *P. americana.* This variety is a cross between Abundance, a Japanese plum, and Brittlewood, an Americana plum. It is grown only in the Middle West and not largely there. It originated with Theodore Williams, Benson, Nebraska, and was first described in 1901. The following is a description of the variety as it grows on the grounds of the New York Agricultural Experiment Station, Geneva, New York, where, it must be said, it fails in both tree- and fruit-characters:

Tree intermediate between those of the two parents. Fruit early, variable in size, nearly spherical; cavity deep, rounded, stem long; suture faint; apex rounded; color light red, a shade darker than the well-known Wild Goose; dots many, small but conspicuous; bloom markedly heavy and characteristic; flesh moderately firm, yellow, juicy, rich and sweet but a little insipid; quality fair to good; stone rather large, oval, flattened, clinging somewhat tenaciously.

PACIFIC. Fig. 203. *P. domestica. Pacific Prune. Willamette.* The purple plums of Pacific are beautiful in color and shape, very large, and few plums of this color excel them in quality. The trees are unusually robust, hardy, and productive. In Oregon, Pacific has not proved a good prune-making plum, but the fruits stand eastern shipment well. The variety has not been well tested in the East, but is well worth general trial for home and market plantations. This plum is badly confused with the Willamette, the two sorts having originated in Oregon about 1875.



203. Pacific. (×1)

Tree large, upright-spreading, open-topped, hardy, productive. Leaves obovate, 2 inches wide, 4 inches long, thick and leathery; apex obtuse; base acute; margin crenate, with small, dark glands; petiole ⅞ inch long, thick, pubescent, tinged red, with 2-4 large, globose, yellowish-green glands. Flowers 1 1/16 inches across, white. Fruit midseason; 2 inches by 1⅝ inches in size, ovate, halves equal; cavity shallow, narrow, flaring; suture shallow, indistinct; apex bluntly pointed; color bluish, overspread with thick bloom; dots small, brown, conspicuous; stem thick, ½ inch long, pubescent, adhering well to the fruit; skin thin, tough, separating readily; flesh pale golden-yellow, juicy, firm, sweet, spicy; good; stone free, flattened, irregularly broad-oval, obliquely contracted at the base, blunt at the apex, with rough and pitted surfaces.

PEACH. *P. domestica.* The fruits of Peach, although not high in quality, are justly esteemed, where the variety can be grown, for earliness, large size, and handsome appearance. Unfortunately, this variety is capricious beyond most other plums as to climate and soils, and refuses to thrive unless its needs are well supplied in the matter of environment. In America, it seems to find congenial soil and climate only on the Pacific coast, and even there refuses to bear well except on strong, rich soils and in sunny exposures. The origin of Peach is unknown, but it has been grown in Europe for more than a century.

Tree large, very vigorous, spreading, round or flat-topped, hardy, medium in productiveness. Leaves large, oval; apex obtuse; margin doubly crenate, with small glands; petiole ¾ inch long, thick, pubescent, with a trace of red, usually with two small, globose, greenish glands. Fruit early; thick-set, without a neck, 1⅞ inches in diameter, round, angular, halves equal; cavity deep, wide, compressed; suture shallow, distinct; apex flattened or depressed; color dark purplish-red, overspread with thin bloom; dots numerous, large, conspicuous; stem 1⅛ inch long, glabrous, adhering well to the fruit; skin tough, adhering; flesh golden-yellow, juicy, firm, subacid, mild; good; stone free, round-oval, flattened, with rough and pitted surfaces, blunt at the base and apex.

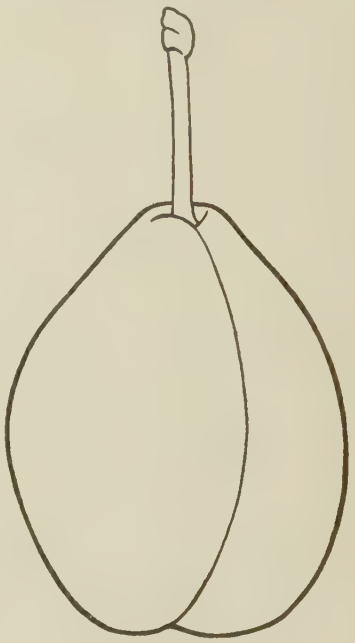
PEARL. *P. domestica.* The rich, golden color, large size, fine form, melting flesh, and sweet, luscious flavor of the fruits, place Pearl among the best dessert plums. The tree-characters, however, do not correspond in desirability with those of the fruits. The trees, while of medium size and seemingly as vigorous and healthy as any, are unproductive. Where this defect does not show, the variety becomes at once one of great value. The fruits of Pearl are said to cure into delicious prunes. This variety ought to be very generally tried by commercial plum-growers, and is recommended to all who grow fruit for pleasure. In 1898, Luther Burbank introduced the variety as a new prune from the seed of the well-known Agen.

Tree of medium size, vigorous, vasiform, dense-topped, hardy. Leaves broadly oval, 1⅞ inches wide, 3½ inches long, thick, leathery; apex abruptly pointed; base abrupt; margin serrate or crenate, with small, black glands; petiole ⅞ inch long, thick, pubescent, tinged red, glandless or with 1-3 small, globose brownish glands. Flowers showy, 1⅝ inches across, white, with a tinge of yellow at the apex of the petals. Fruit mid-season; 1¾ inches by 1½ inches in size, round-oval, compressed, halves unequal; cavity shallow, narrow, abrupt; suture a line; apex depressed; color golden-yellow, obscurely striped and splashed with dull green, mottled, overspread with thin bloom; dots numerous, small, white, clustered about the apex; stem thick, ¾ inch long, thickly pubescent, adhering well to the fruit; skin tough, separating readily; flesh deep yellow, juicy, a little coarse and fibrous, firm but tender, very sweet, with a pleasant, mild flavor, aromatic; very good to best; stone clinging, long-oval, slightly necked at the base, bluntly acute at the apex, with rough surfaces.

PETERS. *P. domestica. Peter Yellow Gage.* Peters ranks with the best varieties in the Reine Claude group to which it belongs—a sufficient recommendation to make it desirable in any home collection of fruit. The fruit, however, is not so attractive in appearance as any one of several other sorts in its group, lacking size and color. The trees are large, hardy, robust, and healthy, surpassing in these respects those of most other Reine Claude sorts. The tree-characters have made this variety a favorite one in western New York for two generations, and one pomologist after another has recommended it for this section; notwithstanding which the variety is now going out of cultivation except for the amateur. William Prince, the first pomologist to mention it, gave a brief description of the variety in 1828.

Tree very large, vigorous, round and dense-topped, hardy, productive. Leaves flattened, oval, 2 inches wide, 4 inches long; apex abruptly pointed or acute; base abrupt; margin crenate, eglandular or with few, small, dark glands; petiole ⅜ inch long, thick, tinged red, pubescent, glandless or with 1 or 2 small, greenish-brown glands. Flowers 1⅛ inches wide, white, creamy at the apex. Fruit late, season short; 1½ inches in diameter, round, compressed, halves equal; cavity shallow, narrow, abrupt; suture shallow; apex flattened or depressed; color dull yellowish-green, often blushed or mottled on the sunny side with thick bloom; dots numerous, large, white, conspicuous; stem 1⅛ inches long, pubescent, adhering well to the fruit; skin thin, tough, separating readily; flesh golden-yellow, juicy, fibrous, firm, sweet next the skin but sour near the center; very good; stone clinging, oval, turgid, acute at the base and apex, with pitted surfaces.

POND. Fig. 204. *P. domestica. Hungarian. Pond Seedling.* Pond is preëminent among plums for its large fruits, which are distinguished also by their form and color, both being pleasing as well as distinctive. The eye



204. Pond. (×1)

is pleased with the plum, but the palate is sadly disappointed, for at best it is not even second-rate. The fruits, however, ship and keep well, as is demonstrated by the large quantities of this variety annually sent from California to the East for sale on fruit-stands, where it perennially beguiles the uninformed fruit-buyer. The trees are satisfactory in most fruit-regions, though small and not always productive. This variety was obtained from seed by a Mr. Pond, an English grower of fruits, as long ago as 1831.

Tree of medium size, vigorous, upright, hardy, variable in productiveness. Leaves oval, 2¼ inches wide, 4 inches long, thick, leathery; petiole ⅝ inch long, thick, pubescent, tinged red, with 1 or 2 globose, yellowish glands. Flowers 1⅛ inches across, white. Fruit late, season short; 2 inches by 1¾ inches in size, obovate, frequently with a neck, halves equal; cavity shallow, narrow, abrupt; suture shallow, often a line; apex roundish; color reddish-purple to purplish-red, overspread with thick bloom; dots numerous, small, reddish-brown, obscure; stem thick, ⅞ inch long, heavily pubescent, adhering well to the fruit; skin tough, separating readily; flesh golden-yellow, dry, fibrous, firm, mild, not highly flavored; fair in quality; stone semi-free to free, long-oval, flattened, the surfaces roughened and deeply pitted, tapering towards the base and apex.

POOLE PRIDE. *P. Munsoniana. Kroh.* Compared with other native plums, Poole Pride has considerable merit. The plum is very attractive in appearance, it seems to have

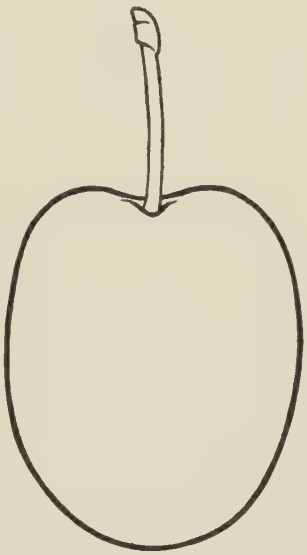
all the characters of a long-keeping and good-shipping sort of its species, and the trees are large, vigorous, hardy, healthy, and productive. The fruits have a very peculiar flavor, incomparable with any other plum or fruit, which, while disagreeable to some, is liked by others. The flesh of this plum is so transparent that the pit can be readily seen when the skin is removed. This variety was raised by P. H. Kroh, Anna, Illinois, about 1880.

Tree large, vigorous, open and round-topped, hardy. Leaves peach-like, 1⅜ inches wide, 3½ inches long, thin and leathery; apex taper-pointed; base abrupt; margin finely crenate, with small dark glands; petiole ⅞ inch long, slender, hairy, light purplish-red, with 1-4 small, globose, reddish-brown glands. Flowers ⅝ inch across, white. Fruit early, season very long; 1 inch in diameter, round-oval, halves equal; cavity very shallow and narrow; suture a distinct line; apex roundish; color clear, dark, currant-red, with thin bloom; dots few, light russet, conspicuous, clustered about the apex; stem slender, ⅝ inch long, glabrous, adhering to the fruit; skin thin, tough, separating from the pulp; flesh semi-transparent, dark amber-yellow, very juicy, fibrous, tender and melting, sweet, with a strong, peculiar flavor; fair quality; stone adhering, long-oval, flattened, compressed at the base, pointed at the apex, rough.

POTTAWATTAMIE. *P. Munsoniana.* This variety is possibly of greater cultural value than any other of its species. The fruit is of high quality, the texture is especially pleasing in eating, and though melting and juicy, it keeps and ships very well because of a tough skin. The plums escape both curculio and brown-rot to a higher degree than the fruits of most varieties of this species. The trees, though dwarfish at maturity, are vigorous, productive, and among the hardiest of the Munsoniana plums, growing without danger of winter-injury to tree or bud as far north as the forty-fourth parallel. Pottawattamie came under the notice of J. B. Rice, Council Bluffs, Iowa, in 1875.

Tree medium in size, dwarfish, round-topped, hardy. Leaves flat, lanceolate, peach-like, 1⅛ inches wide, 3¼ inches long, thin; apex taper-pointed; base abrupt; margin finely serrate or crenate, with small, reddish glands; petiole 1 inch long, slender, tinged red, thinly pubescent, glandless or with 1-5 very small, globose reddish-yellow glands. Flowers ⅝ inch across, creamy-white, with a disagreeable odor. Fruit early, 1 inch in diameter, round-oval, compressed, halves equal; cavity shallow and narrow, abrupt; suture indistinct; apex depressed; color clear currant-red, with thin bloom; dots few, white, conspicuous, clustered about the apex; stem slender, ¾ inch long; skin tough, separating readily; flesh deep yellow, juicy, fibrous, tender and melting, sweet next the skin but sour at the center; good in quality; stone clinging closely, narrow, long-oval, turgid, smooth, flattened and necked at the base, abruptly sharp-tipped at the apex.

QUACKENBOSS. Fig. 205. *P. domestica.* The fruits of Quackenboss possess to a high degree the characters which make a good market plum; they are of large size; round-oval, a better shape for the markets than the prune shapes; very prepossessing in color—a handsome, dark purple with heavy bloom; the flesh is tender, juicy and sweet, making the variety one of the good purple plums. The tree is large, vigorous, hardy, with a round and spreading top, but it does not have the reputation of being fruitful, and the variety fails chiefly as a commercial sort for this reason. The plums ripen late and come on the market at a time when wanted for home canning. The variety has two peculiarities; the petals are comparatively distinct from each other, giving the flower, or a tree in flower, an odd appearance; and the leaves are remarkably variable in size. Quackenboss originated at Schenectady, New York, about 1828.



205. Quackenboss. (×1)

Tree very large and vigorous, round-topped, hardy, productive. Leaves flattened, obovate, variable in size, average 1⅞ inches wide by 3⅝ inches long; apex obtuse; base tapering; margin finely serrate, with small black glands; petiole ⅝ inch long, pubescent, faintly tinged red, glandless or with 1-4 small, globose greenish-yellow glands. Flowers 1⅛ inches across, white, with a yellow tinge at the tips of the opening buds. Fruit late, season short; 1⅝ by 1⅜ inches in size, round-oval, slightly compressed, halves equal; cavity narrow, abrupt; suture shallow, often lacking; apex depressed; color bluish-black, with thick bloom; dots numerous, yellowish-brown, inconspicuous; stem ¾ inch long, pubescent, adhering well to the fruit; skin tender, astringent; flesh deep yellow, juicy, tender, sweet, mild; good; stone semi-free, flattened, irregular-oval, tapering to a long, narrow neck at the base, bluntly acute at the apex, with rough and pitted surfaces.

RED JUNE. *P. salicina. Botan. Long Fruit. Red Nagate. Shiro Smomo.* Red June is distinguished from all other plums by its fruit-characters: the plums are distinctly cordate in shape with a deep cavity and a pointed apex; the color is a mottled garnet-red overlaid with delicate bloom; the flesh is a light yellow, firm enough to endure transportation well, peculiarly aromatic, sweet, and not wholly agreeable in flavor; the stone adheres tightly to the flesh. The trees are large, vigorous, spreading, hardy, healthy, and productive. Other good qualities of the variety are that it blooms late; the fruits are comparatively immune to curculio and brown-rot and

hang to the trees exceptionally well. This is one of the plums that varies in season of ripening, but usually the fruits ripen a week or more before those of Abundance. Red June is somewhat self-sterile. The variety was imported from Japan by H. H. Berger and Company, San Francisco, California, under the name Shiro Smomo, about 1887.

Tree large, vigorous, upright-spreading, hardy, productive, healthy. Leaves oblanceolate, 1 inch wide, 2¾ inches long, thin; apex taper-pointed; base acuminate; margin finely serrate, with small glands; petiole ½ inch long, slender, tinged red, hairy along one side, with 1-3 small, brown glands usually at the base of the leaf. Flowers white. Fruit early, 1½ inches by 1⅜ inches in size, round-cordate, sides unequal; cavity large, deep, narrow, regular, abrupt; suture deep, distinct; apex very pointed; color garnet-red, mottled; bloom thin; dots numerous, small, russet; stem ½ inch long, adhering to the fruit; skin tender, astringent, separating easily; flesh light yellow, fibrous, meaty, sweet except near the center; good; stone clinging, irregular-oval, flattened, pointed at both ends, with pitted surfaces.

REINE CLAUDE. *P. domestica. Green Gage.* For the qualities that gratify the sense of taste—richness of flavor, consistency and texture of flesh, abundance of juice, and pleasant aroma, the fruits of Reine Claude are unsurpassed. Under ordinary cultivation, the plum is not remarkably handsome, but when grown on thrifty trees, the crop thinned, foliage and fruit kept free from pests, and the fruit sufficiently exposed to the sun to color well, it is beautiful. The trees are only of moderate size in the orchard, and in the nursery are so small and wayward that nurserymen hesitate to grow them; although small, they are productive and bear regularly, the chief defect being susceptibility to sun-scald, whereby the bark on the tree is killed and the beginning of the end is marked. Another serious fault is that the fruit cracks badly if showers occur at ripening time. Reine Claude is still one of the most profitable plums grown, and, whether for the commercial or home plantation, deserves a place in the plum orchard. Bavay, a distinct variety, is called the true Reine Claude by many nurserymen and horticultural writers. Green Gage, a synonym of Reine Claude, is preferred by some writers. The variety is an old one from Europe.

Tree of medium size and vigor, round-topped, hardy, productive. Leaves 4½ inches long, 2 inches wide, oval, thick, leathery; apex acute; margin often doubly crenate, glandular; petiole ¾ inch long, tinged red, glandless or with one or two small, globose, greenish glands. Fruit midseason; 1¾ by 1⅝ inches in size, round-oval, halves equal; cavity narrow, regular, abrupt; suture shallow, broad; apex pubescent, slightly depressed; color yellowish-green, indistinctly streaked with green, becoming golden-yellow at full maturity, sometimes mottled on the sunny side with red, overspread with thin bloom; dots very numerous, small, grayish, conspicuous, clustered about the apex; stem thick, ¾ inch long, pubescent; skin tough, adhering to the pulp; flesh greenish-yellow or golden-yellow, juicy, firm, sweet, mild; very good; stone semi-clinging, oval, turgid, tapering at the base, blunt at the apex, with thickly pitted surfaces.

ROBINSON. *P. Munsoniana.* Robinson has long been one of the best known plums of its species. The plums are attractive in coloring, but small in size and comparatively low in quality. The trees are capricious in growth and not so hardy as some others of the species, but where they can be grown are always productive. The variety is rated by some among those that need cross-pollination to insure crops. Robinson may be worth growing in the South and in the states of the Plains. This variety is a seedling grown by a Mr. Pickett, Putnam County, Indiana, about 1835.

Tree often large, vigorous, spreading, not uniform in habit. Leaves lanceolate, peach-like, 1⅝ inches wide, 3½ inches long, thin; apex taper-pointed; base obtuse; margin very finely serrate, with small, dark red glands; petiole slender, ⅝ inch long, reddish, lightly pubescent along one side, glandless or with 1-7 small, globose, reddish-brown glands. Flowers 1 inch across, whitish, somewhat self-sterile. Fruit early; 1 inch in diameter, round-oval, halves equal; cavity of medium depth and width, abrupt; suture a line; apex roundish; color clear currant-red, overspread with thick bloom; dots scattering, large, russet, clustered around the apex; stem slender, ⅝ inch long, glabrous, adhering to the fruit; skin tough, bitter, separating readily; flesh golden-yellow, very juicy, fibrous, tender and melting, sweet next the skin, with some astringency near the center, of pleasant flavor; fair in quality; stone clinging, oval, turgid, very slightly flattened and necked at the base, abrupt-pointed at the apex, roughish.

ROLLINGSTONE. *P. americana. Minnesota.* Rollingstone is an old Americana sort which has been kept in cultivation chiefly because the product is of very good quality. The fruits are dull in color, small, but not unattractive in appearance, and are little troubled by either brown-rot or curculio. The tree is dwarf with a crooked trunk, shaggy bark, unkempt top, and very twiggy—a typical Americana and most difficult to train into a good orchard plant. The variety is characterized by long, conspicuous stamens, stigmas frequently defective, and very large leaves. Rollingstone was found on the Rollingstone Creek, Minnesota, by Mr. O. M. Lord.

Tree dwarf, variable in vigor, spreading, flat-topped, hardy, productive, healthy. Leaves falling early, long-ovate, 1½ inches wide, 3½ inches long, thin; apex taper-pointed; base rather acute; margin coarsely and doubly serrate, eglandular; petiole slender, ⅝ inch long, tinged red, sparingly pubescent, with 1 or 2 small, globose reddish glands. Flowers ¾ inch across, creamy-white, changing to white as the flowers expand. Fruit midseason or earlier; 1 inch in diameter, round, halves equal; cavity shallow, flaring, marked before maturity with light-colored, radiating streaks; suture a line; apex roundish; color dark purplish-red, with thin bloom; dots numerous, small, light russet, inconspicuous; stem slender, 2/16 inch long, adhering poorly to the fruit; skin thick, tough, semi-adherent; flesh orange-yellow, juicy, fibrous, tender and melting, sweet, strongly aromatic; good; stone semi-free, round-oval, flattened, smoothish, blunt at the base and apex.

RUTLAND PLUMCOT. *P. salicina* × *P. americana. Plumcot.* One of the interesting novelties of recent plum-breeding is the Plumcot, grown by Luther Burbank from a cross between the plum and the apricot. As he has not seen the fruit of this remarkable cross, the author is unable to judge of its value to the plum-grower. The variety was introduced by the Fancher Creek Nursery in 1906. The following description is compiled:

Tree vigorous, spreading, open, not a heavy bearer; branches thorny; leaves oval, 1⅝ inches wide, 2⅞ inches long, rather stiff; margin finely and doubly crenate, glandular; petiole greenish-red, with 1-4 globose glands.

The fruit in California attains large size; suture and cavity deep; skin fuzzy like an apricot, purple; flesh deep red, subacid; quality fair; stone large, broad-oval.

SAPA. *P. Besseyi* × *P. salicina.* This variety is another of the hardy plums originated by N. E. Hansen of the South Dakota Experiment Station. The originator gives its parentage as a cross between the western Sand cherry, *P. Besseyi,* and Sultan, a Japanese plum. The new variety first fruited in 1907. Hansen describes the tree as plum-like in growth, and says that one-year-old trees in the nursery bear fruit-buds. The fruit is described as having a dark purple glossy skin and the rich purple flesh of the Sultan. So far, the variety is grown only in the northern states of the Great Plains.

SATSUMA. *P. salicina. Beni Smomo. Blood Plum. Honsmomo.* There is a group of several varieties of Japanese plums unique in having deep red flesh. Of these red-fleshed plums, Satsuma was the first to be introduced in America, and is one of the parents of most of the others. While the fruit is not so large nor so handsome in color as some of its offspring, Satsuma is still one of the best varieties for quality of fruit, and its trees are as good as those of any of the other sorts. The plums keep and ship well, and, if of sufficient size and allowed to color properly, make a good showing on the markets. The trees are above the average for the species in size, habit, health, hardiness, and productiveness, though they bear sparingly when young. They bloom early in the season and are distinguished from other sorts of the same species by having many spurs and short branches along the main branches. Satsuma was raised from the same lot of plum pits from which the Burbank came; the seeds were sent to Luther Burbank by a Japanese agent in 1883.

Tree medium to large, vigorous, upright-spreading, usually quite hardy, moderately productive, bearing heavier crops as the tree becomes older. Leaves lanceolate, 4 inches by 1½ inches in size, of medium thickness; margin finely and doubly crenate, glandular; petiole ¾ inch long, tinged red, with 1-3 reniform, greenish-yellow glands. Blossoms white, borne in pairs or in threes. Fruit midseason or later; 2 inches in diameter; round-cordate, flattened at the base, compressed; suture prominent; apex pointed; color dark dull red, with thin bloom; dots numerous, russet, conspicuous, clustered about the apex; stem slender, ⅜ inch long, glabrous; skin of medium thickness and toughness, bitter, semi-adherent; flesh dark purplish-red, juicy, tender at the skin, tough at the center, sweet, with an almond-like flavor; of good quality; stone semi-clinging or clinging, oval, strongly pointed, rough, red.

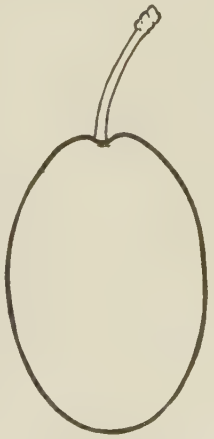
SHIPPER. *P. domestica. Shipper Pride.* This plum has never become an important commercial variety, yet it is offered by a large number of nurserymen. The variety has too many faults to succeed in competition with the many good plums of its color and season. The fruits are dry and often shrivel on the tree, characters which fit it for shipping, but which, with poor quality and small size, make is of little value after it reaches the market. Moreover, the trees fruit sparingly under many conditions, and the crops ripen unevenly. The plum was found by H. S. Wiley, Port Byron, New York, about 1877.

Tree large, vigorous, round-topped, hardy, productive. Leaves many, oval, 1¾ inches wide, 3½ inches long, thick, leathery; apex abruptly pointed or acute; margin serrate or crenate, eglandular or with small dark glands; petiole ½ inch long, thick, pubescent, with a red tinge, or with 1 or 2 globose, yellowish-green glands. Flowers 1¼ inches across, white. Fruit late, 1½ inches by 1⅜ inches in size, ovate, swollen on the suture side, compressed, halves equal; cavity shallow, abrupt; suture shallow; apex bluntly pointed; color purplish-black, overspread with thick bloom; dots small, russet, conspicuous; stem ⅞ inch long, pubescent, adhering well to the fruit; skin thin, tender, separating readily; flesh greenish-yellow, tart, firm, sweet, mild in flavor; inferior in quality; stone semi-clinging, with red tinge near the edge, irregular roundish-ovate, turgid, rough, blunt at the base and apex.

SHIRO. *P. Simonii* × *P. salicina. Late Klondike.* The fruits of Shiro are large and handsome in form and color; the flesh is tender, melting, and juicy, and so translucent that the pit can be seen through the flesh; the plums are pleasant to eat and may be ranked as good in quality; they ship well if not fully mature, but quickly go down after ripening; fruit and tree are susceptible to brown-rot. The trees are vigorous, hardy, and productive. This is one of Burbank's plums, introduced in 1889.

Tree large, vigorous, upright-spreading, tender to cold, productive. Leaves obovate, 1⅞ inches wide, 2¾ inches long, leathery; apex acutely pointed; base acute; margin finely crenate, with small, dark glands; petiole ⅜ inch long, pubescent along one side, greenish-red, with 1 or 2 small, globose, yellowish glands. Flowers white. Fruit very early; 1½ inches in diameter, round-conic, with halves equal; cavity flaring, regular; suture an indistinct line; apex roundish; color light yellow becoming deeper as the season advances, occasionally with a blush, with thin bloom; dots numerous, very minute, white, inconspicuous; stem ⅜ inch long, adhering to the fruit; skin thin, tough, sour, occasionally cracking, separating readily, although a thin coating of flesh is left clinging to the skin; flesh light yellow, semi-transparent, the stone being faintly visible, very juicy, fibrous, melting, sweet, mild, lacks character in flavor; good; stone clinging, broadly oval, flattened, slightly elongated at the base, with rough surfaces.

SHROPSHIRE. Fig. 206. *P. insititia. Damascene. Damson Plum. Shropshire Damson.* Shropshire is the best known of the Damsons, found not only in nearly all commercial plantations, but in the smallest home collections as well. The qualities which make it so generally a favorite are for most part those of the tree, which is not surpassed by any other Insititia in size, vigor, hardiness, and health. The tree is enormously productive, bearing its load of fruit year after year until it is a standard among fruits for



206. Shropshire. (×1)

productivity and reliability in bearing. It has but one defect—unless sprayed the foliage falls prey to fungi and drops early. The trees are easy to manage in pruning, spraying, and harvesting, as they are not so thick-topped, twiggy, and spiny as other Damsons. The fruit is of medium size, and, while in no sense a dessert plum, may be eaten out of hand with relish when fully ripe or after a light frost. Shropshire is one of the best of the Damsons for culinary purposes. It originated in England sometime in the seventeenth century.

Tree vigorous, vasiform, hardy, productive. Leaves flattened, obovate, about 1 inch wide, 2 inches long, thin; apex obtuse or acute; margin finely serrate, eglandular; petiole ½ inch long, slender, greenish-red, with little pubescence, with 1 or 2 small, globose, greenish-yellow glands. Flowers ⅞ inch across, white. Fruit late, season long; 1½ inches by 1 inch in size, oval, compressed, halves equal; cavity shallow, narrow, flaring; suture an indistinct line; apex roundish; color purplish-black, overspread with thick bloom; dots numerous, small, russet; stem slender, ½ inch long, glabrous, adhering to the fruit; skin thin, tender, adhering; flesh golden-yellow, juicy, firm but tender, agreeably tart, pleasant; stone clinging, oval, acute at the base, blunt at the apex, with nearly smooth surfaces.

SIMON. *P. Simonii. Simon's Plum.* The Simon plum constitutes the species *P. Simonii* and has been discussed in the chapter dealing with the botany of the plum on page 123.

SKUYA. *P. americana* × *P. salicina.* From a cross between DeSoto, an Americana, and Red June, a Japanese plum, Hansen of the South Dakota Experiment Station grew eight seedlings of which Skuya is the best. The trees are described by the originator as very strong, stocky, upright growers in the nursery, bearing fruit-buds on one-year-old wood. The fruit is dull, dark red and yellow, sweet and delicious, with a very small pit. The fruits are said to lack somewhat in size and brilliancy of color. The variety was introduced in the spring of 1908 and is now grown more or less in the northern states of the Great Plains.

SMITH ORLEANS. *P. domestica.* In the middle of the last century, Smith Orleans was considered about the best purple plum in America. But the fruit is not high in quality, the texture of the flesh is coarse, and it ripens at a time when fruits are plentiful, for which reason Smith Orleans has ceased to be regarded with favor by the fruit-grower. The trees, however, have some remarkably desirable characters, and the variety should be retained for some locations and purposes and to breed from. Few plums are adapted to a greater range of climates and soils than this one; the trees, too, are of large size, vigorous, healthy, productive, and hold the crop well. Smith Orleans is a seedling of Orleans raised about 1825 by a Mr. Smith, Gowanus, Long Island.

Tree large, vigorous, spreading, open-topped, very productive. Leaves obovate, 2 inches wide, 3⅝ inches long, thick, velvety; apex abruptly pointed or acute; base acute; margin crenate, with few small, dark brown glands; petiole ½ inch long, heavily pubescent, tinged red along one side, with 1 or 2 small, globose, yellow glands. Flowers 1¼ inches across, white, with a yellow tinge. Fruit midseason, 1⅝ inches by 1½ inches in size, oval, compressed, halves unequal; cavity shallow, narrow, abrupt; suture very shallow or a line; apex roundish; color dark purplish-black, overspread with thick bloom; dots numerous, small, russet; stem ¾ inch long, pubescent, adhering to the fruit; skin below medium in thickness, tender, sour, separating readily; flesh pale yellow, juicy, tender, sweet, of pleasant flavor; good; stone clinging, oval, with very rough and deeply pitted surfaces, flattened, tapering abruptly at the base, blunt at the apex.

SOPHIE. *P. Munsoniana.* Without any very distinct merits, Sophie stands high among plums of its kind. The variety is a seedling of Wild Goose, at first supposed by the originator, J. W. Kerr, Denton, Maryland, to have been pollinated by a German Prune which stood near. This is hardly the case, however, as no trace of Domestica blood can be detected in the variety. It was introduced about 1890.

Tree large, very vigorous, spreading, open-topped, productive; branches thorny, shaggy, with long and unbranched limbs. Leaves oval, 1¾ inches wide, 3¼ inches long, thin; margin shallowly crenate, with small glands. Flowers ¾ inch across, white, pinkish as they open, with a disagreeable odor. Fruit late; large, 1⅜ inches by 1⅛ inches in size, obovate, slightly necked, pear-shaped, bright red, covered with thin bloom; dots conspicuous; stem slender, long; flesh deep yellow, juicy, coarse and fibrous, subacid, flat; of fair quality; stone clinging, angular, irregular-obovate, with a peculiar elongated, flattened, oblique base; apex abruptly acute; surfaces rough.

SPAULDING. *P. domestica.* Spaulding is of the Reine Claude group, and, while its fruits are of high quality, the variety is not so good a dessert plum as several similar sorts. Besides being not quite up to the mark in quality, the plums are small and too light in color. Fruit and tree are susceptible to brown-rot and other fungi by which plums are attacked. The tree-characters of this variety are in the main very good but not at all out of the ordinary. Spaulding was brought to notice by J. T. Lovett, Little Silver, New Jersey, in 1888.

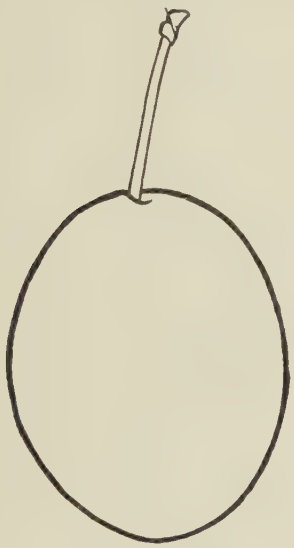
Tree large, vigorous, upright-spreading, dense-topped. Leaves 2 inches wide, 3¼ inches long, thick; apex abruptly pointed or acute; base acute; margin serrate or crenate, with small, dark glands; petiole ⅝ inch long, thick, pubescent, tinged red, with 1-4 small, globose, greenish glands. Flowers 1 inch or more across, white. Fruit midseason; 1⅝ by 1⅜ inches in size, oblong-oval or ovate, compressed, halves equal; cavity small, shallow, abrupt; suture shallow, often a line; apex roundish; color dull greenish-yellow, with stripes and splashes of light green, overspread with thick bloom; dots numerous, small, whitish; stem ¾ inch long, lightly pubescent, adhering well to the fruit; skin thin, tender, separating readily; flesh greenish-yellow, juicy, fibrous, tender, sweet, mild, pleasant; very good; stone semi-free or free, ovate, turgid, slightly pitted, blunt at the base, acute at the apex.

STODDARD. *P americana. Baker.* Stoddard is rated as one of the best of the Americana plums in both fruit- and tree-characters. The firmness of the fruit makes it a good shipping plum of its kind and season. This variety was discovered by B. F. Stoddard, Jesup, Iowa, about 1875.

Tree large, vigorous, spreading, open-topped, productive. Leaves falling early, flattened, oval or obovate, 2¼ inches wide, 4 inches long; margin coarsely serrate, eglandular; petiole tinged red, glandless or with 1-3 glands. Flowers 1 inch across. Fruit midseason; 1⅜

inches in diameter, round-oblate; suture a distinct red line; color light to dark red over a yellow ground, mottled, covered with thick bloom; skin astringent; flesh dark golden-yellow, very juicy, tender and melting, sweet next the skin but tart near the center, with a characteristic flavor; good; stone clinging, broad-oval, strongly flattened, with smooth surfaces.

SUGAR. Fig. 207. *P. domestica. Sugar Prune.* The introduction of Sugar was preceded by very flattering accounts. Possibly expectations in the East were too high; for eastern plum-growers have been greatly disappointed in this plum as compared with its



207. Sugar. (×1)

parent, Agen. The fruits of Sugar in the East are not larger than those of Agen, while in California they are said to be twice or three times as large; the flavor is not so pleasant, although in California the fruit of Sugar is said to be of better quality than that of Agen. The trees of the two plums are much alike, though those of Agen are larger and more productive than those of Sugar as grown in New York. The variety was introduced by its originator, Burbank, in 1899.

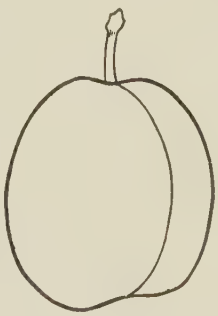
Tree of medium size, vigorous, spreading, dense-topped, hardy, productive. Leaves oval, 2½ inches wide, 5 inches long; apex abruptly pointed; base acute; margin serrate, with small dark glands; petiole 1 inch long, covered with thick pubescence, tinged with red, glandless or with 1-3 small, globose, greenish-yellow glands. Fruit midseason; small, oval, halves equal cavity shallow, narrow, abrupt; suture shallow, often a line; apex roundish or pointed; color dark reddish-purple, changing to purplish-black, covered with thick bloom; dots numerous, small, light russet; stem slender, long, pubescent, adhering; skin thin, tender, separating readily; flesh golden-yellow, juicy, coarse, fibrous, tender, sweet, mild; good to very good; stone light colored, with a tinge of red, thin, of medium size, ovate, flattened, with rough and pitted surfaces, blunt at the base, acute at the apex.

SURPRISE. *P. hortulana Mineri.* Surprise is one of the best of the native plums. The fruits are very attractive in appearance, and, while not of the rich flavor of the Domesticas, they are yet of pleasant flavor; have an abundance of juice; keep well and ship well; and the color is a peculiar red which serves to identify the variety. The trees are productive. Surprise, according to Martin Penning, Sleepy Eye, Minnesota, is the best of a thousand or more seedlings grown from pits of De Soto, Weaver, and Miner sown in 1882.

Tree large, vigorous, upright, dense-topped, hardy, productive. Leaves falling early, ovate, 2 inches wide, 4½ inches long, thin; apex taper-pointed; base abrupt; margin often coarsely and doubly serrate, with amber glands which are not persistent; petiole $\frac{3}{16}$ inch long, slender, reddish, glandless or with 1-5 small, globose, yellowish-brown glands. Flowers ¾ inch across, creamy-white, with a disagreeable odor. Fruit midseason; 1⅜ by 1⅛ inches in size, halves equal; cavity shallow, flaring; suture very shallow, distinct; apex roundish or depressed; color dark red, covered with thin bloom; dots numerous, russet, conspicuous, clustered about the apex; stem ½ inch long, glabrous, adhering to the fruit; skin thick, tough, clinging; flesh golden-yellow, juicy, fibrous, tender, sweet, insipid; quality fair; stone clinging, oval, flattened, pointed at the base and apex, with smooth surfaces.

TATGE. *P. domestica.* Tatge is so similar to Lombard that most authorities on plums consider them identical—certainly they are so nearly alike that a separate description and discussion are not needed. Some plum-growers believe Tatge to be hardier and less subject to brown-rot than Lombard. The variety is grown only in Iowa and neighboring states. It seems to have been brought to notice about 1890 by J. W. Kerr of Maryland.

TENNANT. Fig. 208. *P. domestica.* In size and beauty of form and coloring, the fruits of Tennant have few superiors among plums. While not sufficiently high in quality to be called a first-rate dessert fruit, the fruits are more palatable than most other purple plums; they ripen at a good time of the year, several days before the Italian Prune; and both ship and keep well. The trees are large, vigorous, healthy, hardy, and productive—almost ideal plum-trees. This variety should be very generally tried in commercial plantations, and may well be planted in home collections for culinary fruit. On the Pacific coast, the fruits are cured for prunes, their meaty flesh fitting them very well for this purpose. Tennant originated with Rev. John Tennant, Ferndale, Washington, and was introduced in 1893.



208. Tennant. (×¾)

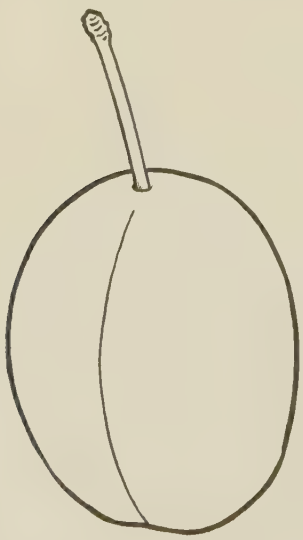
Tree large, vigorous, round-topped, open, hardy, productive. Leaves obovate, 1¾ inches wide, 3½ inches long, thick, stiff; apex abruptly pointed to acute; base acute; margin crenate, with small, brown glands; petiole ⅝ inch long, thick, tinged red along one side, hairy, glandless or with 1 or 2 rather large, globose, brownish glands. Flowers 1 inch or more across, white,

the buds tinged yellow. Fruit midseason; 1¾ inches in diameter, round-oblong, with irregular surface which is somewhat ridged, halves equal; cavity narrow, abrupt, compressed; suture distinct; apex deeply depressed; color dark reddish-purple, with thick bloom; dots numerous, white, conspicuous, clustered about the apex; stem thick, ⅜ inch long, pubescent, adhering well to the fruit; skin tough, adhering slightly to the pulp; flesh dark golden-yellow, dry, coarse, tough, firm, sweet, mild but pleasant; of good quality; stone clinging, irregular-oval, flattened, obliquely necked, blunt at the apex, with deeply pitted surfaces, rough.

TERRELL. *P. salicina* × *P. Munsoniana.* Terrell is one of the leading plums in Florida and the Gulf states, and was placed on the fruit-list of the American Pomological Society for this region in 1903. It is noteworthy as one of the few crosses between the Japanese plum and *P. Munsoniana.* The variety was introduced by the Glen St. Mary Nurseries, Glen St. Mary, Florida, in 1904, and is a seedling of the older and better-known Excelsior.

Tree healthy, vigorous, productive, bearing heavy crops annually. Fruit ripens in June in Florida, medium to large, nearly round; suture a line but distinct; apex blunt; cavity medium in depth, abrupt; stem short and slender; skin thin, tough, a little astringent, reddish-yellow, somewhat mottled and deepening to wine-red; dots minute to conspicuous, yellow; flesh greenish-yellow, firm, subacid, sweet, rich; quality rated as good to very good in the South; stone small, broadly oval, turgid, clinging rather tenaciously.

TRAGEDY. Fig. 209. *P. domestica.* The fruits of Tragedy are very attractive in appearance—above medium size, a dark, rich



209. Tragedy. (×1)

purple color, and having the full, rounded form much liked by consumers in a dessert plum. The flesh is juicy, tender, and sweet, so that the quality may be called good; possibly the flesh is a little too soft for distant shipping or long keeping. The trees are very satisfactory, except that in some regions they are not quite as reliable in bearing as could be wished. A fault is a large proportion of the pits are cracked and many are soft and granular. A plum with the good qualities possessed by Tragedy should be better known. Tragedy originated as a chance seedling on the farm of O. R. Runyon, Sacramento, California.

Tree large, vigorous, round-topped, hardy, variable in productiveness. Leaves obovate, 1¾ inches wide, 3¾ inches long; apex acute or obtuse; base acute; petiole ⅝ inch long, thick, pubescent, faintly tinged red, glandless or with 1 or 2 small, globose, greenish-brown glands. Flowers ⅞ inch across, white. Fruit early, season short; 1⅝ by 1⅜ inches in size, oval, swollen on the suture side, compressed, halves unequal; cavity narrow, abrupt, regular; suture shallow, often an indistinct line; apex roundish; color dark purplish-black with thick bloom; dots numerous, russet, inconspicuous; stem ⅝ inch long, pubescent, adhering well to the fruit; skin separating readily; flesh greenish-yellow, juicy, tender, sweet, mild; good; stone clinging, irregular-oval, flattened, obliquely necked; apex acute; surfaces pitted, roughish.

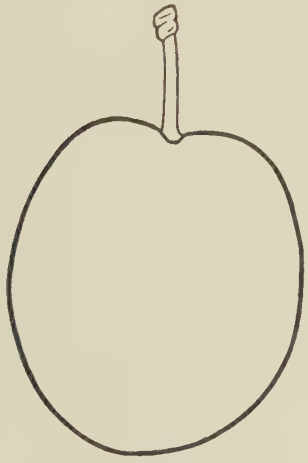
UNGARISH. *P. domestica. Hungarian. Hungarian Prune. Hungary. Ungarish Prune.* Budd's Ungarish as grown at the New York State Experiment Station is nearly identical with Italian. The only differences are: the Italian fruit is smaller, a little firmer, not so broad, nor quite so sweet as that of Ungarish. The pit of the latter is usually tinged with red, while that of the former is rarely so colored. If Ungarish proves as productive as Italian, it may be more desirable because of its larger fruits. In 1883, Professor J. L. Budd of the Iowa Experiment Station Imported trees under the name Quetsche de Hongrie or Zwetsche Ungarische from Russia. Budd disseminated the variety as Hungary, a name soon changed to Hungarian and later to Ungarish. This is not to be confused with the true Hungarian, so well known in Europe as the Quetsche de Hongrie.

VORONESH. *P. domestica. Moldavka. Voronesh Yellow.* Voronesh is a Russian sort supposed to be ironclad to cold. The trees are very productive; and the fruits are attractive enough in size and color to meet market demands, but the flavor is so insipid as to make the plum unfit for dessert and hardly fit for kitchen use. In 1881, Professor J. L. Budd imported from Voronesh, Russia, a variety which he introduced as Voronesh Yellow. At the same time he imported a variety under the name Moldavka which proved to be identical with Voronesh Yellow. The variety is distinct in tree and fruit from other sorts of its species.

Tree of medium size, round-topped, productive. Leaves drooping, narrow-obovate, 2¼ inches wide, 4½ inches long, thick; margin doubly serrate, with small, yellowish-red glands. Flowers 1⅛ inches across, dull white. Fruit midseason, ripening period short; 1⅞ by 1½ inches in size, ovate, necked, enlarged on the suture side, dark lemon-yellow, with thin bloom; dots very numerous, white, conspicuous; stem adhering strongly to the fruit; skin tough, sour; flesh dark amber-yellow, very tender, sweet, mild; poor; stone free, long-oval, flattened, somewhat necked, acute at the apex, the surfaces smooth or partially honeycombed.

WASHINGTON. Fig. 210. *Bolmar. Jackson. Superior Green Gage.* The fruits of Washington are large; handsome in form and

color; abundant in juice, yet firm and meaty enough in flesh to keep and ship well; and very good in flavor. The trees are large, hardy, vigorous, and healthy; remarkable for their broad, glossy, abundant leaves; and bear bountiful crops annually at a favorable period of maturity. The variety, however, is not without defects; the fruits are subject to brown-rot; the quality varies greatly in different locations and years; the trees are slow in



210. Washington. (×1)

coming in bearing; and the crops are small for some years after fruiting begins. While this variety is almost always worth planting in a home collection, the location for it as a commercial fruit needs to be chosen with care. About the year 1790, the pits of twenty-five quarts of Green Gage plum were planted by the Princes at Flushing, Long Island. From one of these Washington came.

Tree large, vigorous, round and open-topped, hardy, very productive. Leaves flattened, oval, 2½ inches wide, 4¼ inches long, leathery, velvety; apex acute; base abrupt; margin serrate, eglandular; petiole ⅝ inch long, green, pubescent, glandless or with 1 or 2 smallish, globose, greenish-yellow glands. Flowers appearing after the leaves, $1\frac{5}{8}$ inches across, white, with yellow near the apex. Fruit midseason; 1¾ by 1⅝ inches in size, round-oval, compressed, halves equal; cavity shallow, narrow, flaring; suture shallow; apex roundish; color greenish-yellow, with green stripes and splashes, occasionally with a faint blush on the sunny side, with thin bloom; dots numerous, white, inconspicuous; stem ½ inch long, with thick pubescence, adhering strongly to the fruit; skin thin, sour, separating readily; flesh greenish-yellow, juicy, firm, tender, sweet, mild, pleasant flavor; good to very good; stone free, oval, turgid, roughened, somewhat blunt at the base and apex.

WAYLAND. *P. hortulana.* Wayland is of little interest to plum-growers who grow the Domestica varieties without difficulty, but in the South and Middle West it is an important representative of a valuable species. The trees withstand the hot, dry weather in the region south of central Iowa and Nebraska rather better than do those of varieties of other species, and the fruits are borne in such quantities and so late that this and kindred sorts become important plums. The fruits are quite too firm of flesh, too sour, and too small to be of value for dessert purposes, but they are most excellent for jellies, marmalades, and preserves; they are also best adapted for long-keeping and shipping of all the native plums. The trees are large, robust, and hardy as far north as central New York; usually free from attacks of insects and fungi; and, with their abundant, glossy foliage, are strikingly ornamental. Wayland was found in a plum thicket on the premises of Professor H. B. Wayland, Cadiz, Kentucky.

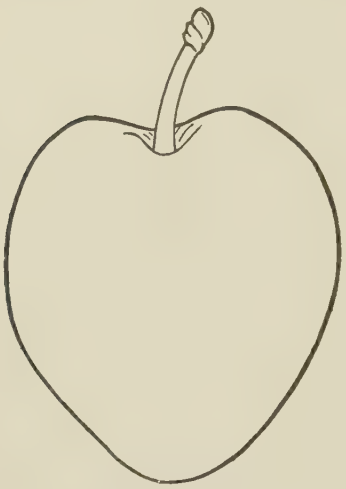
Tree very large and vigorous, spreading, somewhat drooping, flat-topped, open, hardy. Leaves long-oval, peach-like, 1⅞ inches across, 5 inches long, thin; apex acuminate; base abrupt; margin unevenly serrate, glandular; petiole 1 inch long, slender, pubescent along one side, with a tinge of red, with 1-5 very small, globose, brownish glands. Flowers $\frac{13}{16}$ inch across, white, with disagreeable odor. Fruit very late, season long; 1⅛ by 1 inch in size, round-ovate, narrowing toward the stem, conical, slightly compressed, halves equal; cavity deep, narrow, abrupt; suture shallow and wide, often a distinct line; apex pointed; color dark currant-red, with inconspicuous, thin bloom; dots numerous, conspicuous, densely clustered about the apex; stem slender, ⅝ inch long, glabrous, not adhering to the fruit; skin thick, tough, clinging but slightly; flesh light yellow, juicy, coarse, fibrous, tender, sweet next the skin but astringent towards the pit; fair to good; stone clinging, long-oval, somewhat elongated at the base and apex, turgid with rough and pitted surfaces.

WEAVER. *P. americana.* Weaver is an old and well-known Americana, once one of the most popular of its species because of hardiness and productiveness. It is still listed by many nurserymen, and is widely distributed throughout the country, but is now rapidly passing out of cultivation, being superseded by sorts producing larger and better colored fruits. This variety was found growing wild on the Cedar River, in Iowa, by a Mr. Weaver, about 1870.

Tree large, vigorous, well formed, upright-spreading, unusually hardy, productive. Leaves falling late, 4½ inches long, 2½ inches wide, oval, firm, thick, leathery; apex acuminate; base acute; margin deeply and coarsely serrate; petiole ⅝ inch long, stout, reddish, slightly pubescent along one side, usually with 2 large, globose, reddish-brown glands. Flowers large, prominently stalked. Fruit midseason or later; 1 by ¾ inch in size, large, oval or round-oblong, compressed, halves unequal; cavity shallow, narrow, abrupt; suture shallow, distinct; apex roundish or depressed; color yellowish overlaid with purplish-red, mottled with thin bloom; dots numerous, small, often purplish, inconspicuous; skin thick, very tough, astringent, adhering to the pulp; flesh deep yellow, juicy, firm and meaty, sweet, mild; fair to good; stone long and narrow, oval, flattened, obscurely pointed at the base and apex, smooth.

WICKSON. Fig. 211. *P. salicina* × *P. Simonii. Eureka. Perfection.* The fruit of Wickson is the largest of the Oriental plums, if not the largest of all plums; it is of handsome color and distinct form; the flesh is firm and of a peculiar flavor, generally considered pleasant. These characters and the narrow upright tree, with its long lanceolate leaves, mark the variety as a new and for some parts of the country a valuable addition to pomology. In the East, the variety is a little

tender in tree and bud, hardy only where the peach can be grown; it blooms too early to be safe from frost; it is susceptible to brown-rot;

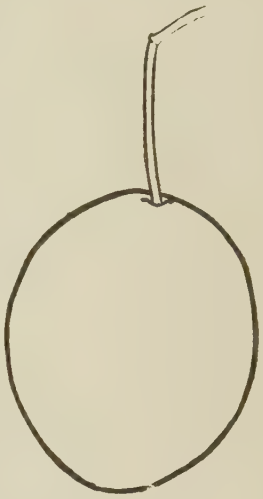


211. Wickson. (×1)

the trees are late in coming in bearing and are not reliable in fruiting; the fruits ripen unevenly; and the trees are not of good form for heavy crops. In California, however, Wickson is one of the leading Japanese sorts, and is apparently growing in favor. Wickson is the best known of Burbank's many plums. It was first described in 1892.

Tree medium to large, vigorous, with narrow, upright head, dense-topped, tender to cold, an uncertain bearer. Leaves oblanceolate, 1 inch wide, 3 inches long, thin; apex taper-pointed; base cuneate; margin finely serrate, with reddish glands; petiole ⅜ inch long, faintly tinged red, glandless or with 1-9 small, reniform, greenish or yellow glands. Flowers appearing after the leaves, intermediate in size, white. Fruit early midseason; 2⅛ inches in diameter, obliquely cordate, halves unequal; cavity deep, abrupt, with concentric rings; suture prominent and deep, with a prolonged tip at the apex; color dark red over a yellow ground, indistinctly splashed with darker red, mottled with thin bloom; dots numerous, small, yellow, densely clustered about the apex; stem thick, $\frac{1}{16}$ inch long, glabrous; skin thin, tender, separating easily; flesh amber-yellow, juicy, coarse, fibrous, firm, sweet, pleasant but not high in flavor; good; stone clinging, oval or ovate, pointed, with pitted surfaces.

WILD GOOSE. Fig. 212. *P. Munsoniana.* Wild Goose was the first of the native plums to be generally grown as a distinct variety. It is probably a parent of more sorts than any other variety of the several cultivated native species; most of its offspring so strongly resemble it that its name has been given to a group of closely related sorts. In spite of the great number of native plums that have been introduced in recent years, Wild Goose is still a favorite. Good qualities of the plum are: bright attractive color; tender and melting flesh with a sprightly and refreshing flavor; a tough skin which fits it well for shipment and long-keeping; comparative freedom from brown-rot and curculio. The trees are large, hardy, healthy, and, when cross-pollinated, very productive. Wherever planted, there should be some other native sort blooming at the same time for cross-pollination. About 1820, M. E. McCrance, Nashville, Tennessee, shot a wild goose; his wife, in dressing the goose, found a plum seed in its craw, which, planted, produced the Wild Goose tree.



212. Wild Goose. (×1)

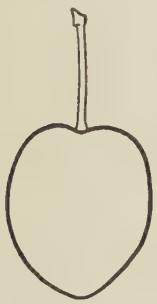
Tree very large and vigorous, wide spreading, flat-topped, hardy. Leaves lanceolate, peach-like, 4¼ inches long, 1½ inches wide, thin; apex taper-pointed; base abrupt; margin finely serrate, with small, reddish-black glands; petiole ⅝ inch long, slender, pubescent along one side, tinged red, glandless or with 1-6 globose, yellow or reddish-brown glands. Flowers ¾ inch across, white, with disagreeable odor. Fruit very early; 1⅜ by $1\frac{7}{8}$ inches in size, oval, halves equal; cavity small, narrow, shallow, abrupt; suture an indistinct line; apex round or pointed; color bright red, with thin bloom; dots few, light russet, conspicuous, clustered about the apex; the stem attached to a stem-like growth from the fruit-spurs gives the appearance on the tree of a jointed stem, very slender, ¾ inch long, glabrous, not adhering to the fruit; skin tough, astringent, separating readily; flesh yellowish, juicy and fibrous, tender and melting, sweet next the skin but sour at the center, sprightly; fair to good; stone adhering, long and narrow-oval, flattened, slightly necked at the base, acute at the apex, roughened.

WOLF. *P. americana mollis.* Wolf is noted for great hardiness, reliability in bearing, attractive and well-flavored fruits, and for being one of the few freestones of its kind. This plum is remarkably well adapted for the northern part of the Mississippi Valley, and there, only, it is worth planting extensively. This variety was raised from a pit of a wild plum planted on the farm of D. B. Wolf, Wapello County, Iowa, about 1852.

Tree large, vigorous, spreading, low, and open-topped, hardy, productive, healthy. Leaves falling early, oval, 1⅞ inches wide, 3⅞ inches long, thin; apex taper-pointed; margin coarsely and doubly serrate, eglandular; petiole ½ inch long, velvety, tinged red, glandless or with 1 or 2 small, globose glands. Flowers 1 inch across, the buds tinged yellow, changing to white as the flowers expand. Fruit midseason, 1 inch in diameter, round-oval, compressed, halves equal; cavity shallow, narrow, abrupt; suture an indistinct line; apex roundish or flattened; color dull crimson, thickly mottled, with thick bloom; dots numerous, small, russet; stem slender, glabrous, adhering poorly to the fruit; skin thick, tough, roughened, astringent, adhering; flesh golden-yellow, very juicy, fibrous, tender and melting, sweet next the skin; astringent toward the center; fair to good; stone semi-free to free, roundish-obovate, tapering at the base, blunt at the apex, with smooth surfaces.

WOOD. *P. americana.* Wood seems to have considerable merit for cold climates. The plum is attractive in color; above the average size; and good in quality. The trees, in habit of growth and in productiveness, are better than those of most Americanas. The fruit ripens sufficiently early to fit into the short seasons of northern latitudes. This variety is a seedling from a chance plum found growing in Cottonwood County, Minnesota.

Tree of medium size, spreading, hardy, dense-topped, an annual and abundant bearer. Leaves falling early, ovate, 2 inches wide, 4 inches long, thin; apex taper-pointed; base abrupt; margin coarsely serrate, with long, taper-pointed teeth, eglandular; petiole 5/8 inch long, slender, tinged red, lightly pubescent, glandless or with 1 or 2 small, globose, greenish-red glands. Flowers 1 1/8 inch across, white. Fruit midseason, ripening period short; 1 1/4 inch in diameter, oblate, compressed, oblique, halves equal; cavity flaring; suture a line; apex flattened or depressed; color dark red over a yellow ground, mottled, with thin bloom; dots numerous, light russet, inconspicuous; stem 1/2 inch long, glabrous, detaches from the fruit when ripe; skin thick, tough, sour, adhering; flesh orange-yellow, juicy, coarse, fibrous, tender and melting, sweet, lacking in flavor; fair in quality; stone free, roundish, flattened, slightly oblique, blunt and flattened at the base, roundish at the apex, smooth.



213. World Beater. (×1)

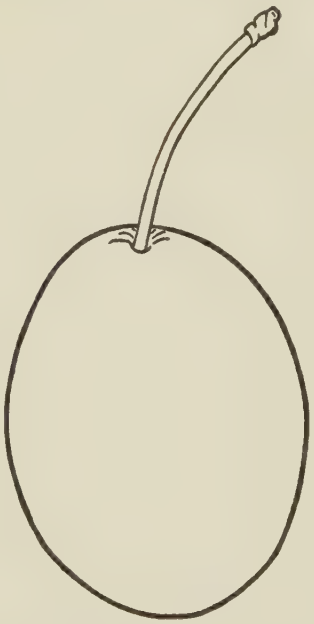
WORLD BEATER. Fig. 213. *P. hortulana.* World Beater is very similar to Wayland, the plums differing from those of the latter variety in being a week earlier, a little smaller, and more oval. In tree-characters, World Beater is perhaps the better plum. This variety may be recommended for culinary purposes and as a late plum for regions where the peach is hardy. World Beater was grown by J. H. Tinsley from a seed planted near Nashville, Tennessee, in 1838.

Tree large, vigorous, spreading, open and flat-topped, hardy where the peach can be grown, productive. Leaves broadly lanceolate, peach-like, 1 3/4 inches wide, 4 1/2 inches long, thin; apex acuminate; base abrupt; margin serrate, glandular; petiole 1 inch long, slender, tinged red, pubescent on one side, with 2-6 small, globose, brownish glands. Flowers 3/4 inch across, white, with a disagreeable odor. Fruit very late, season short; 1 by 7/8 inch in size, round-ovate or oval, halves equal; cavity narrow, shallow, abrupt; suture a line; apex pointed; color carmine, bloomless; dots medium in number, small, conspicuous; stem slender, glabrous, not adhering to the fruit; skin thick, tough, astringent, adhering slightly; flesh light yellow, juicy, coarse, melting near the skin but firmer and fibrous next the pit, sweet except near the center, strongly aromatic; fair to good; stone often tinged red, adhering, oval, turgid, angular, pointed at the base and apex, roughish.

WYANT. *P. americana.* Wyant is one of the standard Americana plums, ranking well with the best in both fruit- and tree-characters. The plums do not have the distinctive Americana taste; the flesh is less juicy; the skin is free; and the stones are nearly free and have pitted surfaces. Some of these characters are so valuable in a native plum that Wyant may well be used to breed from. This variety was found by J. B. Wyant, Janesville, Iowa.

Tree small, spreading and straggling, flat-topped, very hardy, productive, healthy. Leaves falling early, oval, 1 5/8 inches wide, 3 1/4 inches long, thin; apex acuminate; base abrupt; margin coarsely and doubly serrate, the serrations sharp-pointed, not glandular; petiole 1/2 inch long, tinged red, pubescent, glandless or with 1-5 globose, yellowish-green glands. Flowers showy on account of the many blossoms and peculiar appearance caused by the numerous long stamens, whitish, with disagreeable odor. Fruit midseason; 1 1/4 inches in diameter, oblong-obovate, oblique, truncate, halves equal; cavity shallow, narrow, flaring; suture a line; apex flattened; color dark carmine over a yellow ground, with thin bloom; dots numerous, light russet, inconspicuous; stem slender, 1/2 inch long, glabrous, dehiscent; skin thin, tender, separating readily; flesh dark golden-yellow, juicy, tender and melting, sweet; of fair quality; stone nearly free, broadly oval, flattened, blunt at the base, somewhat pointed at the apex, with pitted, dark colored surfaces.

YELLOW EGG. Fig. 214. *P. domestica. Dame Aubert. Mogul. Wentworth. White Mogul. White Egg. Yellow Magnum Bonum.*



214. Yellow Egg. (×1)

Producing the largest and handsomest of plums, Yellow Egg is worth consideration by either the amateur or the commercial fruit-grower. At best, however, the fruit is fit only for cooking, and is none too good for culinary purposes. The trees are very satisfactory on all but very light soils. This plum ought to be crossed with varieties of better quality with the hope of getting as handsome a fruit, but one which could be used for dessert purposes. It is an old European variety.

Tree large, vigorous, round-topped, open, hardy, very productive. Leaves flattened, oval, 2½ inches wide, 4½ inches long, leathery; apex abruptly pointed or acute; margin doubly serrate, with few dark glands; petiole ⅝ inch long, thick, reddish-purple, pubescent, glandless or with 1 or 2 globose, yellowish-green glands. Flowers 1 inch across, white, with a yellowish tinge at the tip of the petals. Fruit late, season short; 2 by 1⅝ inches in size, long-oval, compressed, halves nearly equal; cavity narrow, abrupt; suture shallow, often a line; apex roundish; color golden-yellow, with thick bloom; dots numerous, white, inconspicuous; stem slender, 1¼ inches long, pubescent, adhering well to the fruit, surrounded at the cavity by a fleshy collar; skin thin, astringent, separating readily; flesh golden-yellow, juicy, coarse, firm, mild; good; stone semi-free or free, oval, flat, acute at the base and apex, with roughened and pitted surfaces.

PART III

THE GRAPE

CHAPTER XIII

BOTANY OF THE GRAPE

The botany of the grape is simple. The organs of vine and fruit are easily recognized, and there are no other pomological plants with which the species of Vitis can be confused. While there are several cultivated species, each constitutes a natural group so distinct that the grower can hardly mistake one for another, if he has knowledge of the structure and habits of growth of the botanical groups of grapes. While it is less easy to distinguish horticultural varieties, this is not so difficult a task as with tree-, bush-, or bramble-fruits, since the differences in structure and habits are greater. Attention must now be called to the differences in organs on which botanical and horticultural classifications are founded.

The grape plant.

The structure of the root is important in distinguishing species. The roots of some species of the grape are soft and succulent, as those of *V. vinifera,* while the same organs in other species, as in most American grapes, are hard and fibrous. They may also be few or numerous, deep or shallow, spreading or restricted, fibrous or non-fibrous.

Species of grapes have very characteristic vines. A glance at a vine enables one to tell the European grape from any of the American grapes; so also one is able to distinguish most of the American species by the aspect of the vine. Many varieties of any species of grape are readily told by the size and habits of the plant. Size of vine is rather more variable than other gross characters because of the influences of environment, such as food, moisture, light, isolation, and pests; yet size in a plant or the parts of a plant is a very reliable character when proper allowances are made for environment.

The degree of hardiness is a very important diagnostic character in determining both species and varieties of grapes, and very largely indicates their value for the vineyard. Thus the varieties of the European grape are less hardy than the peach, while our American Labruscas and Vulpinas are as hardy as the apple. The range of varieties as to hardiness falls within that of the species, and cultivated varieties hardier than the wild grape are not found. Grapes are designated in descriptions of varieties and species as *hardy, half-hardy,* and *tender.*

Habit of growth varies but little with changing conditions, and is thus an important means of distinguishing species and varieties; not infrequently it stamps the variety as fit or unfit for the vineyard. Habit of growth gives aspect to the vine. Thus a vine may be upright, drooping, horizontal, stocky, straggling, spreading, dense, or open. The vine may grow rapidly or slowly, and may be long-lived or short-lived; the trunk may be short and stocky or long and slender. These several characters largely determine whether a vine is manageable in the vineyard. Productiveness, age of bearing, and regularity of bearing are distinctive characters with cultivated grapes. The care given the vine influences these characters; yet all are helpful in identifying species and varieties, and all must be considered by the grape-grower.

Immunity and susceptibility to diseases and insects are most valuable diagnostic characters of species and varieties of grapes. Thus species differ widely in resistance to phylloxera, the grape-louse, the grape leaf-hopper, the flea-beetle, berry-moth, root-worm, powdery-mildew, downy-mildew. anthracnose, and other insect and fungous troubles of this fruit.

Minor structures of the plant.

The structure of the bark is an important distinguishing character for some species, but is of little importance in identifying the variety, and has no economic value to the fruit-grower. In most species of grapes, the bark has distinct lenticels, and on the old wood separates into long thin strips and fibers; but in two species from southeastern North America the bark bears prominent lenticels and never shreds. Smoothness, color, and thickness are other attributes of the bark to be noted.

Canes of different species vary greatly in total length and in length of internodes. They vary also in size, in number, and in color, while the shape in some species is quite distinctive, being in some round, in others angular, and in still others flattened. The direction of growth in canes, whether sinuous, straight, or zigzag, is an important character. Nodes and internodes are indicative characters in some species, nodes being more or less prominent, angular or flattened, while the internodes are long or short.

The diaphragm distinguishes several species of grapes. The cane contains a large pith, and this in most species is interrupted by woody tissue, forming a diaphragm at the nodes. In the Rotundifolia grapes the diaphragm is absent, while in several other American species it is very thin, and in still others quite thick. The character of the diaphragm is best observed in year-old canes. In studying the

diaphragm, notice should be taken also of the pith, which is very variable in size.

Young shoots of the grape offer a ready means of distinguishing species and varieties through their color and the amount and character of the pubescence. Shoots may be glabrous, pubescent or hairy, and even spiny.

The tendril is one of the organs most used in determining species and varieties of grapes. In some species, as *V. Labrusca,* there is a tendril or an inflorescence opposite nearly every leaf; these are *continuous* tendrils. All other species have two leaves with a tendril opposite each and a third leaf without a tendril, called *intermittent* tendrils. To study this organ it is necessary to have vigorous, healthy, typical canes. Tendrils may be long or short, stout or slender; simple, bifurcated, or trifurcated; smooth, pubescent, or warty.

Buds and flowers.

The number of inflorescences borne by species is an important character in some cases. All species, excepting *V. Labrusca,* average two inflorescences to a cane, but *V. Labrusca* may bear from three to six inflorescences, each in the place of a tendril opposite the leaf.

Buds of different species of grapes vary greatly in time of opening, as they do somewhat in varieties, so that the time the buds begin to swell is a fine mark of distinction. The angle at which the bud stands out from the branch is of some value in determining species. Differences in color, size, shape, position, and amount of pubescence of buds must all be noted in describing grapes. The scales of the buds vary more or less in size and in thickness.

The time of bloom is an easy mark of distinction between several species of grapes, and helps as well to distinguish varieties in a species. Most species of grapes bear fertile flowers on one vine and sterile flowers on another, and are, therefore, polygamous-dicecious. Sterile vines bear male flowers with abortive pistils, so that, while they never produce fruits themselves, they usually assist in fertilizing others. Fertile flowers are capable of ripening fruits without cross-pollination. Vines with female flowers only are seldom found. In most species of the grape, plants with sterile flowers and those with complete flowers are found mixed in the wild state, but usually only the fertile plants have been selected for cultivation. Plants raised from seeds of any of the species, however, furnish many sterile vines.

The degree of fertility of blossoms is also a fine mark of distinction in species and varieties of the grape. Fertile vines are of two kinds in most species. The flowers on one kind are perfect hermaphrodites, while in the other kind the stamens are smaller and shorter than the pistil, and eventually bent down and curved under. These may be called imperfect hermaphrodites, since they are seldom as fruitful as the perfect hermaphrodites, unless fertilized from another plant. On examination with a microscope, it is found that self-sterile plants usually bear abortive pollen and that the percentage of abortive pollen-grains varies greatly in different varieties. The upright or depressed stamen does not always indicate the condition of the pollen, since there are many instances in which upright stamens bear impotent pollen, and occasionally the depressed stamens bear perfect pollen.

Leaves.

The size, shape, and color of the leaves are quite distinctive of species and more or less so of varieties, if allowances are made for variation due to environment. The lobing of leaves is a very uniform character in most species, some having lobes and others having entire leaves. The upper surface of the leaf in some species is smooth, glossy, and shiny, and in others is rough and dull. The lower surface shows similar variations and has, besides, varying amounts of pubescence, down, and bloom. In some species the down resembles cobwebs. The number, size, and shape of the lobes are important in distinguishing both varieties and species, as are also the petiolar, basal, and lateral sinuses. As in most plants, the margins of the leaves, whether serrate, dentate, or crenate, are often distinguishing characters. The petiole in different species varies from short to long and from stout to slender. Lastly, the time at which the leaves fall is often a good distinguishing mark.

The fruit.

Of all organs, the fruit is most responsive to changed conditions and hence most variable. Yet the fruits furnish most valuable characters for determining both species and varieties. Size, shape, compactness, and number of clusters on a shoot must be noted. In the berry, size, shape, color, bloom, adherence of stigma to the apex, and adhesion of fruit to the pedicel are all of value. Difference in adherence of the skin to the pulp separates European from all American grapes. The color of the brush is often a certain distinguishing character. The thickness, toughness, flavor, and pigment of the skin have more or less value. The color, firmness, juiciness, aroma, and flavor of the flesh, as well as its adherence to seed and skin, are valuable marks in describing grapes. All species and varieties are well distinguished by the time of ripening and by the keeping quality. The color of the juice is a plain and certain dividing line between some species and many varieties.

Seeds are accounted of much value in determining species. The size and weight of seed differ greatly in different species, as they do also in varieties of any one species. Thus, of native grapes, Labrusca has the largest and heaviest seeds, and Vulpina has the smallest seeds, while those of Æstivalis are of medium size and weight. The shape and color of seed offer distinguishing marks, while the size, shape, and position of the raphe and chalaza furnish very certain marks of distinction in some species.

THE GENUS VITIS

The genus Vitis belongs to the vine family (Vitaceæ) in which most botanists also put the woodbines (Ampelopsis), of which Virginia creeper is the best-known plant. The genus Cissus, to which belong many southern climbers, is combined with Vitis by some botanists. Vitis is separated from Ampelopsis and Cissus by marked differences in several organs, of which, horticulturally at least, those in the fruit best serve to distinguish the group. Species of Vitis, with possibly one or two exceptions, bear pulpy edible fruits; species of Ampelopsis and Cissus bear fruits with pulp so scant that the berries are inedible. Vitis is further distinguished as follows:

The plants are climbing or trailing, rarely shrubby, with woody stems, and mostly with coiling, naked-tipped tendrils. The leaves are simple, palmately lobed, round-dentate, or heart-shaped-dentate. The stipules are small, falling early. The flowers are polygamous-dioecious (some plants with perfect flowers, others staminate with at most a rudimentary ovary), five-parted. The petals are separated only at the base and fall off without expanding. The disk is hypogynous with five nectariferous glands which are alternate with the stamens. The berry is globose or ovoid, few-seeded, and pulpy. The seeds are pyriform, and beak-like at the base.

The description blank for the grape on the following page sets forth most of the characters students and fruit-growers will use in describing this fruit.

SPECIES OF AMERICAN GRAPES

The number of species of grapes in the world depends on the arbitrary limits set for a species of this fruit, and knowledge of the genus is yet too meager to set these limits with certainty. Indeed, the men who have made grape species have seldom been able to outline the habitats of their groups with much certainty. In habitat, it should be said, grapes are confined almost wholly to temperate and subtropical regions. However, the grape-grower is not much concerned with species of grapes other than those that have horticultural value. Of these, in America, there are now ten more or less cultivated either for fruit or for stocks. The following descriptions of these ten species are adapted from the author's *The Grapes of New York,* published in 1908 by the State of New York (Chapter IV, pages 107-156).

CONSPECTUS OF CULTIVATED SPECIES OF VITIS

A. Skin of mature berry separating freely from the pulp.
  B. Nodes without diaphragms; tendrils simple.
    1. *V. rotundifolia.*
    2. *V. Munsoniana.*
  BB. Nodes with diaphragms; tendrils forked.
    C. Leaves and shoots glabrous at maturity and without bloom; tendrils intermittent.
      D. Leaves thin, light, bright green, generally glabrous below at maturity except perhaps in the axils of the veins with a long or at least a prominent point and usually long and sharp teeth or the edge even-jagged.
        E. Leaves broader than long; petiolar sinus usually wide and shallow..... 3. *V. rupestris.*
        EE. Leaves ovate in outline; petiolar sinus usually medium to narrow..... 4. *V. vulpina.*
      DD. Leaves thick, dull colored or grayish-green, often holding some close, dull pubescence below at maturity, shoots and leaves nearly always more or less pubescent when young; the teeth mostly short..... { 5. *V. cordifolia.* / 6. *V. Berlandieri.*
    CC. Leaves rusty or white tomentose or glaucous blue below, thick or at least firm.
      D. Leaves flocculent or cobwebby or glaucous below when fully grown..... { 7. *V. æstivalis.* / 8. *V. bicolor.*
      DD. Leaves densely tomentose or felt-like beneath throughout the season; covering white or rusty white.
        E. Tendrils intermittent..... 9. *V. candicans.*
        EE. Tendrils mostly continuous. 10. *V. Labrusca.*
AA. Skin and pulp of mature berry cohering. (Old World.).....11. *V. vinifera.*

1. *Vitis rotundifolia,* Michx. Muscadine Grape. Bull Grape. Bullet Grape. Bushy Grape. Bullace Grape. Scuppernong. Southern Fox Grape. Vine very vigorous, sometimes shrubby and only 3 or 4 feet high, often sending down aërial roots; wood hard, bark smooth, not scaling, with prominent warty lenticels; shoots short-jointed, angled, with fine scurfy pubescence; diaphragms absent; tendrils intermittent, simple. Leaves small, broadly cordate or roundish; petiolar sinus wide, shallow; margin with obtuse, wide teeth; not lobed; dense in texture, light green color, glabrous above, sometimes pubescent along veins below. Cluster small, loose; peduncle short; pedicels short, thick. Berries large, globular, black or greenish-yellow; skin thick, tough and with a musky odor; pulp tough; ripening unevenly and dropping as soon as ripe. Seeds flattened, shallowly and broadly notched; beak very short; chalaza narrow, slightly depressed with radiating ridges and furrows; raphe a narrow groove.

The habitat of this species is southern Delaware, west through Tennessee, southern Illinois, southeastern Missouri, Arkansas (except the northwestern portions), to Grayson County, Texas, as a northern and western boundary, to the Atlantic Ocean and the Gulf on the east and south. It becomes rare as one approaches the western limit, but is common in many sections of the great region outlined above, being most abundant on sandy, well-drained bottom lands, along river banks and in swampy, thick woodlands and thickets. The climate most suitable for Rotundifolia is that in which cotton grows, and it thrives best in the lower portions of the cotton-belt of the United States.

The fruit of Rotundifolia is very characteristic. The skin is thick, has a leathery appearance, adheres strongly to the underlying flesh, and is marked with lenticel-like russet dots. The flesh is more or less tough, but the toughness is not localized around the seed as in Labrusca. The fruits in most of the varieties of the species are characterized by a strong, musky aroma and are lacking in sugar and acid. At present, the most promising outlook for Rotundifolia varieties is for use as grape-juice and culinary grapes. Rotundifolia does not produce fruit suitable for shipping as dessert grapes, chiefly because the berries ripen unevenly, and when ripe drop from the cluster. The juice which exudes from the point where the stem is broken off causes the berries to become smeared and gives them an unattractive appearance. Owing, however, to the tough skin, the berries do not crack so badly

DESCRIPTION BLANK FOR THE GRAPE

Name ..... Vineyard..... Row ..... No..... Date..... 19....

VINE

Marked characteristics .....
- Vigorous, medium, weak
- Upright, horizontal
- Straggling, dense, open
- Tender, half-hardy, hardy
- Very productive, productive
- Medium productive, unproductive

SUSCEPTIBILITY to
- Insects .....
- Diseases .....

TRUNK
- Large, medium, small
- Stocky, medium, slender

Bark
- Loose, adherent
- Smooth, shreddy

CANES
- Long, medium, short
- Numerous, medium, few
- Thick, medium, slender
- Ash-gray, yellow, green
- Red, brown
- Sinuous, straight, zigzag

Nodes
- Enlarged, angular, flattened

Internodes
- Long, medium, short

Tendrils
- Continuous, intermittent
- Thick, medium, slender
- Long, medium, short
- Simple, bifurcated, trifurcated
- Smooth, warty

FLOWERS
- Fertile or sterile
- Date of bloom .....
- Early, medium, late

Stamens
- Upright, reflexed

LEAVES
- Large, medium, small
- Cordate, roundish
- Thick, medium, thin

Upper surface
- Light, medium, dark green
- Dull, glossy
- Smooth, medium, rugose

Lower surface
- Pale green, bronze
- Bluish, whitish

Pubescent, downy, hairy

Woolly, cobwebby

Lobes
- Number .....
- Terminal lobe
  - Obtuse, acute, acuminate

Petiolar sinus
- Deep, medium, shallow
- Wide, medium, narrow
- Closed, overlapping

Basal sinus
- Deep, medium shallow
- Wide, medium, narrow

Lateral sinus
- Deep, medium, shallow
- Wide, medium, narrow

Margin
- Serrate, dentate, crenate

Teeth
- Shallow, medium, deep
- Wide, medium, narrow

FRUIT

Marked characteristics .....

DATE OF RIPENING .....

SEASON
- Early, medium, late

KEEPING QUALITY .....

SHIPPING QUALITY .....

CLUSTER
- Large, medium, small
- Long, medium, short
- Broad, medium, slender
- Roundish, tapering, cylindrical
- Regular, irregular
- Single, double-shouldered
- Loose, medium, compact

Peduncle
- Long, medium, short
- Thick, medium, slender

Pedicel
- Long, medium, short
- Thick, medium, slender
- Warts

Brush
- Long, medium, short
- Wine, pink, yellow

BERRY
- Strongly or medium adherent, shells
- Large, medium, small
- Uniform, variable
- Roundish, oval, oblate
- Black, blue
- Light or dark purple
- Light or dark red
- Light or dark green
- Amber, yellow, white
- With thick, medium, thin bloom

SKIN
- Thick, medium, thin
- Tough, medium, tender
- Adheres or separates from pulp

FLESH
- White, greenish, red
- Transparent, translucent
- Meaty, medium, soft, melting
- Tender, tough, stringy
- Juicy, medium, dry
- Clear, pink, wine-colored
- Sweet, subacid, sprightly
- Sour, vinous, musky
- Spicy, foxy

Quality
- Best, very good, good
- Fair, poor, very poor

SEEDS
- Separate from pulp
  - Easily, with difficulty
- Average number
- Large, medium, small
- Long, medium, short
- Broad, medium, narrow
- Notched, rounded
- Blunt, pointed, beaked
- Brown, yellow

Raphe
- Obscure, medium, cord-like

Chalaza
- Above center, median, below center
- Circular, oval
- Distinct, obscure
- Raised, sunken

USE
- Dessert, kitchen
- Market, home, raisin

DESIRABILITY .....

REMARKS .....

.....

as other grapes would under the same conditions, but, nevertheless, they are not adapted to long-distance shipments. Under reasonably favorable conditions, the vines attain great size, and, when grown on arbors without pruning, cover a large area.

Rotundifolia is remarkably resistant to the attacks of all insects and fungal diseases. The phylloxera do not attack its roots, and it is considered as resistant as any other American species to this pest. The vines are grown from cuttings only with difficulty, and this prevents the use of this species as a resistant stock. However, under favorable circumstances this is a successful method of propagation. Under unfavorable circumstances it is better to depend on layers. As a stock upon which to graft other vines, this species has not been a success. There is great difficulty in crossing Rotundifolia with other species, but several Rotundifolia hybrids are now on record.

2. *Vitis Munsoniana*, Simpson. Florida Grape. Everbearing Grape. Bird Grape. Mustang Grape of Florida. Vine slender, usually running on the ground or over low bushes; canes angular; internodes short; tendrils intermittent, simple. Leaves smaller and thinner than in Rotundifolia and rather more circular in outline; not lobed; teeth open and spreading; petiolar sinus V-shaped; both surfaces smooth, rather light green. Cluster with more berries but about the same size as in Rotundifolia. Berry one-third to one-half the diameter, with thinner and more tender skin; black, shining; pulp less solid, more acid and without muskiness. Seeds about one-half the size of those of Rotundifolia, similar in other respects.

The habitat of *V. Munsoniana* is central and southern Florida and the Florida Keys. It extends south of the habitat of Rotundifolia, and blends into this species at their point of meeting. Munsoniana appears to be a variation of Rotundifolia, fitted to subtropical conditions. It is tender, not enduring a lower temperature than zero. In the matter of multiplication, its differs from *V. rotundifolia* in that it can be propagated readily from cuttings. Like Rotundifolia it is resistant to phylloxera.

3. *Vitis rupestris*, Scheele. Mountain Grape. Rock Grape. Bush Grape. Sand Grape. Sugar Grape. Beach Grape. A small, much branched shrub or, under favorable circumstances, climbing; diaphragm thin; tendrils few, or if present, weak, usually deciduous. Leaves small; young leaves frequently folded on midrib; broadly cordate or reniform, wider than long, scarcely ever lobed, smooth, glabrous on both surfaces at maturity; petiolar sinus wide, shallow; margin coarsely toothed, frequently a sharp, abrupt point at terminal. Cluster small. Berries small, black or purple-black. Seeds small, not notched; beak short, blunt; raphe distinct to indistinct, usually showing as a narrow groove; chalaza pear-shaped, sometimes distinct, but usually a depression only.

This species is an inhabitant of southwestern Texas, extending eastward and northward into New Mexico, southern Missouri, Indiana, and Tennessee to southern Pennsylvania and the District of Columbia. Its favorite places are gravelly banks and bars of mountain streams or the rocky beds of dry watercourses. The clusters of fruit are small, with berries about the size of a currant, and varying from sweet to sour. The berry is characterized by much pigment under the skin. The fruit has a sprightly taste wholly free from any disagreeable foxiness. Rupestris under cultivation is said to be very resistant to rot and mildew of the foliage. The attention of hybridizers was attracted to this species over thirty years ago, and various hybrids have been produced of great promise for grape-breeding. The root system of Rupestris is peculiar in that the roots penetrate at once deeply into the ground instead of extending laterally as in other species. Like those of Vulpina, the roots are slender, hard, and resistant to phylloxera. The species is easily propagated by cuttings. The vines bench-graft readily, but are difficult to handle in field grafting.

4. *Vitis vulpina*, Linn. (*V. riparia*, Michx.) Winter Grape. River Grape. Riverside Grape. Riverbank Grape. Sweet-scented Grape. Vine very vigorous, climbing; shoots cylindrical or angled, usually smooth, slender; diaphragms thin; tendrils intermittent, slender, usually bifid. Leaves with large stipules; leaf-blade large, thin, entire, three- or lower ones five-lobed; sinuses shallow, angular; petiolar sinus broad, usually shallow; margin with incised, sharply serrate teeth of variable size; light green, glabrous above, glabrous but sometimes pubescent on ribs and veins below. Cluster small, compact, shouldered; peduncle short. Berries small, black with a heavy blue bloom. Seeds 2-4, small, notched, short, plump, with very short beak; chalaza narrowly oval, depressed, indistinct; raphe usually a groove, sometimes distinct.

Vulpina is the most widely distributed of all American species of grape. It has been discovered in parts of Canada north of Quebec, and thence southward to the Gulf of Mexico. It is found from the Atlantic coast westward, most botanists say, to the Rocky Mountains. Usually it grows on river banks, on islands, or in upland ravines. Vulpina has always been considered of great promise in the evolution of American grapes. It can hardly be said that it has fulfilled expectations, as there is probably no pure variety of this species of more than local importance, and the results of hybridizing it with other species have not been wholly successful.

Vulpina is adapted to a great variety of climates, soils, and locations; vines have withstood a temperature of 40 to 60 degrees below zero, and they show equal ability to withstand the injurious effects of high temperatures in the summer. On account of its habit of early blooming, the blossoms sometimes suffer from late frosts in the spring. The berries of Vulpina are small, but there are occasional varieties with fruits of medium size or above. The clusters are of medium size, and, if judged from the standpoint of number of berries, might frequently be called large. The flavor is sharply acid but free from foxiness or any disagreeable wild taste. If eaten in quantity, the acidity is likely to affect the lips and the tip of the tongue. The flesh is neither pulpy nor solid, and dissolves in the mouth and separates readily from the seed. The roots are small, hard, numerous, branch freely, feed close to the surface, and do not seem to be well adapted to forcing their way through heavy clays. The vines grow readily from cuttings and make good stocks for grafting, the union with other species being usually permanent. Vulpina is very re-

sistant to phylloxera, but is less resistant to black-rot than Æstivalis, though more so than Labrusca. The foliage is rarely attacked by mildew. One of the chief failings of this species is the susceptibility of the leaves to the attack of the leaf-hopper.

5. *Vitis cordifolia,* Michx. Winter Grape. Frost Grape. Fox Grape. Chicken Grape. Heart-leaved Vitis. Possum Grape. Sour Winter Grape. Vine very vigorous, climbing; shoots slender; internodes long, angular, usually glabrous, sometimes pubescent; diaphragms thick; tendrils intermittent, long, usually bifid. Leaves with short, broad stipules; leaf-blade medium to large, cordate, entire or indistinctly three-lobed; petiolar sinus deep, usually narrow, acute; margin with coarse angular teeth; point of leaf acuminate; upper surface light green, glossy, glabrous; glabrous or sparingly pubescent below. Clusters medium to large, loose, with long peduncle. Berries numerous and small, black, shining, little or no bloom. Seeds medium in size, broad, beak short; chalaza oval or roundish, elevated, very distinct; raphe a distinct, cord-like ridge. Fruit sour and astringent and frequently consisting of little besides skins and seeds.

Owing to the fact that Cordifolia and Vulpina have been badly confused, the limits of the habitat of this species are difficult to determine. The best authorities give the northern limit as New York or the Great Lakes. The eastern limit is the Atlantic Ocean; the southern limit, the Gulf of Mexico. It extends westward to the western limits of the wooded portion of the Mississippi Valley in the North, and to the Brazos River, Texas, in the South. The species is found along creeks and river banks sometimes mixed with Vulpina, having about the same soil adaptations as that species. It is a very common species in the middle states, frequently growing on limestone soils, but is not indigenous to such soils. Cordifolia makes a good stock for grafting, as it is vigorous and forms a good union with most of our cultivated grapes. It is seldom used for this purpose, however, on account of the difficulty of propagating it by means of cuttings. For the same reason, the vines are seldom found in cultivation.

6. *Vitis Berlandieri,* Planch. Mountain Grape. Spanish Grape. Fall Grape. Winter Grape. Little Mountain Grape. Vine vigorous, climbing; shoots more or less angled and pubescent; pubescence remaining only in patches on mature wood; canes mostly with short internodes; diaphragms thick; tendrils intermittent, long, strong, bifid or trifid. Leaves with small stipules; leaf-blade large, broadly cordate, notched or shortly three-lobed; petiolar sinus rather open, V- or U-shaped, margin with broad but rather shallow teeth, rather dark glossy green above, grayish pubescence below when young; becoming glabrous and even glossy except on ribs and veins, when mature. Clusters large, compact, compound, with long peduncle. Berries small, black, with thin bloom, juicy, rather tart but pleasant tasting when thoroughly ripe. Seeds few, small, short, plump, oval or roundish, with short beak; chalaza oval or roundish, distinct; raphe narrow, slightly distinct to indistinct.

Berlandieri is a native of the limestone hills of southwest Texas and adjacent Mexico. The roots are strong, thick, and very resistant to phylloxera. It is propagated by cuttings with comparative ease, but its varieties are variable; some do not root at all easily. While the fruit of this species shows a large cluster, the berries are small and sour, and Berlandieri is not regarded as having promise for culture in America.

7. *Vitis æstivalis,* Michx. Blue Grape. Bunch Grape. Summer Grape. Little Grape. Duck-shot Grape. Swamp Grape. Chicken Grape. Pigeon Grape. Vine very vigorous, shoots pubescent or smooth when young; diaphragms thick; tendrils intermittent, usually bifid. Leaves with short, broad stipules; leaf-blade large, thin when young but becoming thick; petiolar sinus deep, usually narrow, frequently overlapping; margin rarely entire, usually three- to five-lobed; teeth dentate, shallow, wide; upper surface dark green; lower surface with more or less reddish or rusty pubescence which, in mature leaves, usually shows in patches on the ribs and veins; petioles frequently pubescent. Clusters long, not much branched, with long peduncle. Berries small, with moderate amount of bloom, usually astringent. Seeds two to three, of medium size, plump, smooth, not notched; chalaza oval, distinct; raphe a distinct cord-like ridge.

The division of the original species has materially reduced the habitat of Æstivalis, confining it to the southeastern part of the United States from southern New York to Florida and westward to the Mississippi River. The fruit usually has a tart, acrid taste, due to the presence of a high percentage of acid, but there is also a large amount of sugar. The berries are destitute of pulp, have a comparatively thin, tough skin and a peculiar spicy flavor; they hang to the bunch when ripe much better than do those of Labrusca. This species thrives in a lighter and shallower soil than Labrusca, and appears to endure drouth better, although not equaling in this respect either Vulpina or Rupestris. The leaves are never injured by the sun, and they resist the attacks of insects, such as leaf-hoppers, better than any other American species under cultivation. Æstivalis is rarely injured by black-rot or mildew. The hard roots enable it to resist phylloxera, and varieties with any great amount of the blood of this species are seldom seriously injured by this insect. An objection to Æstivalis, from a horticultural standpoint, is that it does not root well from cuttings. Varieties of this species bear grafting well, especially in the vineyard.

Vitis æstivalis Lincecumii, Munson. Post-oak Grape. Pine-wood Grape. Turkey Grape. Vine vigorous, sometimes climbing high upon trees, sometimes forming a bushy clump from two to six feet high; canes cylindrical, much rusty wool on shoots; tendrils intermittent. Leaves very large, almost as wide as long; entire or three-, five-, or rarely seven-lobed; lobes frequently divided; sinuses, including petiolar sinus, deep; smooth above, and with more or less rusty pubescence below. Fruit small to large, usually larger than typical Æstivalis. Seeds pear-shaped; chalaza roundish.

Lincecumii inhabits the eastern half of Texas, western Louisiana, Oklahoma, Arkansas, and southern Missouri on high sandy land, frequently climbing post-oak trees; hence the name post-oak grape, by which it is locally known. The species has attracted considerable attention as a promising form from which to secure cultivated varieties for the Southwest. The qualities which recommend it are: first, vigor; second, capacity to withstand rot and mildew; third, hardiness and capacity to endure hot and dry summers without injury; fourth, the large cluster and berry which are

Plate XI.—Niagara Grape.

found on certain of the wild vines. The fruit is characteristic because of its dense bloom; firm, yet tender texture, and peculiar flavor. The cultivated varieties have given satisfaction in many sections of the central and southern states. Like Æstivalis, it is difficult to propagate from cuttings.

Vitis æstivalis Bourquiniana, Bailey. Southern Æstivalis. Bourquiniana differs chiefly from the type in having thinner leaves; the shoots and under side of the leaves are only slightly reddish-brown in color; the pubescence usually disappears at maturity; the leaves are more deeply lobed than is common in Æstivalis; and the fruit is larger, sweeter and more juicy. Bourquiniana is known only in cultivation. It includes many southern varieties, the most important of which are Herbemont and Lenoir. The only northern variety of any importance supposed to have Bourquiniana blood is Delaware. Bourquiniana can be propagated from cuttings more easily than the typical Æstivalis. Many of the varieties of Bourquiniana show a marked susceptibility to mildew and black-rot. The roots are hard, branch rather freely, and are quite resistant to phylloxera.

8. *Vitis bicolor,* Le Conte. Blue Grape. Northern Summer Grape. Northern Æstivalis. Vine vigorous, climbing; shoots cylindrical or angled, with long internodes, generally glabrous, usually showing much blue bloom, sometimes spiny at base; diaphragms thick; tendrils intermittent, long, usually bifid. Leaves with short, broad stipules; leaf-blade large; roundish-cordate, usually three; petiolar sinus variable in depth, usually narrow; margin irregularly dentate; teeth acuminate; glabrous above, usually glabrous below and showing much blue bloom which sometimes disappears late in the season; young leaves sometimes pubescent; petioles very long. Cluster of medium size, compact, simple; peduncle long. Berries small, black with much bloom, acid but pleasant tasting when ripe. Seeds small, plump, broadly oval, very short beak; chalaza oval, raised, distinct; raphe distinct.

Bicolor is readily distinguished from Æstivalis by the absence of the reddish pubescence and by blooming later. The habitat of the species is to the north of that of Æstivalis, occupying the northeastern quarter of the United States. The horticultural characters of Bicolor are much the same as those of Æstivalis. About the only points of difference are that it is much hardier, is less resistant to mildew, and more resistant to phylloxera. Like Æstivalis, Bicolor does not thrive on limy soils, and is difficult to propagate from cuttings. The horticultural possibilities of Bicolor are much the same as those of Æstivalis. It is as yet cultivated but little. Its chief defect for domestication is the small size of the fruit.

9. *Vitis candicans,* Englem. Mustang Grape. Vine very vigorous, climbing; shoots and petioles densely woolly, whitish or rusty; diaphragm thick; tendrils intermittent. Leaves with large stipules; blade small, broadly cordate to reniform-ovate, entire or in young shoots and on young vines and sprouts usually deeply three- to five-, or even seven-lobed; teeth shallow, sinuate; petiolar sinus shallow, wide, sometimes lacking; dull, slightly rugose above, dense whitish pubescence below. Clusters small. Berries medium to large, black, purple, green, or even whitish, thin blue bloom or bloomless. Seeds usually three or four, large, short, plump, blunt, notched; chalaza oval, depressed, indistinct; raphe a broad groove.

The habitat of this grape extends from southern Oklahoma southwesterly into Mexico. It is found on dry, alluvial, sandy, or limestone bottoms, or on limestone bluff lands. The species blooms shortly before Labrusca and a week later than Vulpina. It requires the long hot summers of its native country, will stand extreme drouth, but is not hardy to cold. The berries, which are large for wild vines, have thin skins, under which there is a pigment that gives them, when first ripe, a fiery, pungent taste, but which partly disappears with maturity; they are very persistent, clinging to the pedicel long after ripe. Candicans is difficult to propagate from cuttings. Its roots resist phylloxera fairly well. It makes a good stock for Vinifera vines in its native country, but, owing to the difficulty of propagation, is seldom used for that purpose. It is not regarded as having great promise for horticulture.

10. *Vitis Labrusca,* Linn. Fox-Grape. Vine vigorous, stocky, climbing; shoots cylindrical, densely pubescent; diaphragms medium to thick; tendrils continuous, strong, bifid or trifid. Leaves with long, cordate stipule; leaf-blade large, thick, broadly cordate or round; entire or three-lobed, frequently notched; sinuses rounded; petiolar sinus variable in depth and width, V-shaped; margin with shallow, acute-pointed, scalloped teeth; upper surface covered with dense pubescence, becoming glabrous when mature; lower surface covered with dense pubescence, more or less whitish on young leaves; becomes dun-colored when mature. Clusters more or less compound, usually shouldered, compact; pedicels thick; peduncle short. Berries round; skin thick, covered with bloom, with strong musky or foxy aroma. Seeds two to four, large, distinctly notched, beak short; chalaza oval in shape, indistinct, showing as a depression; raphe, a groove.

Labrusca is indigenous to the eastern part of North America, between the Atlantic Ocean and the Alleghany Mountains, from Maine to Georgia. It has furnished more cultivated varieties than all other American species together. The reason for this is, partly, that it is native to the portion of the United States first settled, and is the most common grape in the region where agriculture first advanced to the condition at which fruits were desired; and, partly, to the fact that, in its wild state, Labrusca is probably the most attractive to the eye of all American grapes, on account of the size of its fruit.

Two types of the species may be distinguished. Vines are found in the woods of New England which resemble Concord very closely in both vine and fruit, excepting that the grapes are much smaller in size and more seedy. There are also the large-fruited, foxy Labruscas, usually with reddish berries, represented by such cultivated varieties as Northern Muscadine, Dracut Amber, Lutie, and others. Labrusca is peculiar amongst American grapes in showing black-, white- and red-fruited forms of wild vines growing in the woods.

The root system of Labrusca does not penetrate the soil deeply, but the vine succeeds better in deep and clayey soils than Æstivalis. It endures an excess of water in the soil, and, on the other hand, requires less water for successful growing than Æstivalis or Vulpina. In spite of its ability to withstand clayey soils, it prefers loose, warm, well-drained sandy lands to all others. All varieties of this species show a marked antipathy to limestone soil. The

Labruscas succeed very well in the North, and fairly well in the Middle West as far south as Arkansas. The grapes of Labrusca are large and usually handsomely colored. The skin is thick, covering a layer of adhering flesh, which gives the impression of its being thicker than it actually is; the berry is variable in tenderness, sometimes tough, but in many cultivated varieties is so tender that it cracks in transportation. The skin of this species usually has a peculiar aroma, generally spoken of as *foxy*, and a slightly acid, astringent taste. The center of the berry is occupied by dense pulp, more or less stringy, with considerable acid close to the seeds. Many object to the foxy aroma of this species, but, nevertheless, the most popular American varieties are more or less foxy. Labrusca submits well to vineyard culture, is fairly vigorous, and generally quite productive. It grows readily from cuttings, and in hardiness is intermediate between Vulpina and Æstivalis. The roots are soft and fleshy, and in some localities subject to attacks of phylloxera. In the wild vines, the fruit is inclined to drop when ripe. This defect is known among grape-growers as "shattering" or "shelling," and is a serious weakness in some varieties. Labrusca is said to be more sensitive to mildew and black-rot than any other American species. In the South, and in some parts of the Middle West, the leaves of all varieties of Labrusca sunburn and shrivel in the latter part of the summer.

11. *Vitis vinifera*, Linn. European Grape. Old World Grape. Vine variable in vigor, not so high climbing as most American species; tendrils intermittent. Leaves round-cordate, thin, smooth, and when young, shining, frequently more or less deeply three-, five-, or even seven-lobed; usually glabrous but in some varieties the leaves and young shoots are hairy and even downy when young; lobes rounded or pointed; teeth variable; petiolar sinus deep, narrow, usually overlapping. Berries very variable in size and shape, usually oval. Seeds variable in size and shape, usually notched at the upper end and characterized always by a bottle-necked, elongated beak; chalaza broad, usually rough, distinct; raphe indistinct. Roots large, soft and spongy.

The region about the Caspian Sea is the probable habitat of the Old World grape. Neither American nor European writers agree as to the climate desired by Vinifera, for the reason, probably, that all the varieties in this variable species do not require the same climatic conditions. There are certain phases of climate, however, that are well agreed on: the species requires a warm, dry climate and is more sensitive to change of temperature than American species. Varieties of this species can be grown successfully in a wide variety of soils, being much less particular as to soils than American sorts.

Certain characters of the fruit of this species are not found in any American species: first, the skin, which is attached very closely to the flesh and which is never astringent nor acid, can be eaten with the fruit; second, the flesh is firm, yet tender, and uniform throughout, differing in this respect from all American grapes, which have a tough and more or less acid core at the center; third, the flavor has a peculiarly sprightly quality known as vinous; fourth, the berry adheres firmly to the pedicel, the fruit seldom "shattering" or "shelling" from the cluster.

In the various hybrids that have been made between American and Vinifera varieties, it is usually found that the desirable qualities of Vinifera are inherited in about the same proportion as the undesirable ones. The fruit is improved in the hybrid, but the vine is weakened; quality is usually purchased at the expense of hardiness and disease-resisting power. Vinifera may be grown very readily from cuttings.

CHAPTER XIV

VARIETIES OF GRAPES

Ten species of native grapes have furnished about 2,000 varieties of this fruit to American viticulture. Possibly twice as many more are described in European viticultural literature from *V. vinifera* alone, more than 300 of which have been tried in America. The varieties described are those offered by American nurserymen, although possibly not all of the natives can now be purchased, and probably Californian nurserymen can supply a considerably greater number of Vinifera varieties than are included in this list. Few other fruits offer so great a number of combinations of sizes, colors, flavors, aromas, and uses as can be found in the following 133 grapes. The vineyard, to fulfill its potentialities, should have a well-selected assortment of the kinds described. Varieties of this fruit enrich pomology in nearly every part of the continent in which diversified agriculture is practiced.

ACTONI. *V. vinifera.* Actoni is a table-grape of the Malaga type which ripens at Geneva, New York, late in October, too late for the average season in the East, but worth trying in favorable locations. It is grown in California, but is not a favorite sort. The following brief description is made from fruit grown at Geneva:

Clusters large, shouldered, tapering, loose. Berries medium to very large, long-oval, clear green yellow; flesh crisp, firm; flavor sweet; quality good.

215. Agawam. (×⅓)

AGAWAM. Fig. 215. *V. Labrusca* × *V. vinifera.* The qualities commending Agawam are large size and attractive appearance of bunch and berry; grapes of rich, sweet, aromatic flavor; vigor of vine; and capacity for self-fertilization. For a variety having its proportion of European blood, the vine is vigorous, hardy, and productive. The chief defects of the fruit are a thick and tough skin, coarse, solid texture of pulp, and foxy flavor. The vine is susceptible to the mildews, and in many localities does not yield well. Although the grapes ripen soon after those of Concord, they can be kept much longer, and even improve in flavor after picking. The vines prefer heavy soils, and do better on clay than on sand or gravel. This is one of the grapes grown by E. S. Rogers, Salem, Massachusetts.

Vine vigorous, hardy, productive. Canes thick, dark brown; nodes enlarged, flattened; internodes short; tendrils intermittent, bifid to trifid. Leaves thick; lobes lacking; terminus acute; petiolar sinus deep, narrow; lateral sinus very shallow; teeth shallow, wide. Flowers on plan of 6, nearly self-fertile, open late; stamens upright. Fruit midseason, keeps until midwinter. Clusters medium to large, short, broad, tapering, loose; pedicel short; brush very short, pale green. Berries large, oval, dark purplish-red with thin bloom, very persistent; skin thick, tough, adherent, astringent; flesh pale green, translucent, tough, stringy, solid, foxy; good. Seeds adherent, 2-5, large, long, brown.

ALMERIA. *V. vinifera.* This is one of the varieties commonly found in eastern markets from Almeria and Malaga, Spain, although occasionally it may come from California, where the variety, or similar varieties confused with it, is now grown. This sort is remarkable for fruits of wonderful keeping qualities; it is adapted only to hot interior regions. The Almeria cultivated by the California Experiment Station is described as follows:

"Vine vigorous. Leaves of medium size, round and slightly or not at all lobed, quite glabrous on both sides, teeth obtuse and alternately large and small; bunches large, loose or compact, irregular conical. Berries from small to large, cylindrical, flattened on the ends, very hard and tasteless."

AMERICA. *V. æstivalis Lincecumii* × *V. rupestris.* The notable qualities of America are vigor of growth and health of foliage in vine, and persistence of berries, which have strongly colored red juice, high sugar-content, and excellent flavor. The grapes wholly lack the foxy taste and aroma of Labrusca; and the variety, therefore, offers possibilities for breeding sorts lacking the foxy flavor of Concord and Niagara. Also, it is said to be a suitable stock upon which to graft Vinifera varieties to resist phylloxera. The vigor of the vine and the luxuriance of the foliage make it an excellent sort for arbors. America was grown by T. V. Munson, Denison, Texas; it was introduced about 1892.

Vine vigorous, hardy, productive. Canes long, numerous, dark reddish-brown with heavy bloom; nodes enlarged, flattened; tendrils intermittent, long, bifid. Leaves small, thin; upper surface glossy, smooth; lower surface light green, hairy; lobes lacking or faint, terminal one acute; petiolar sinus deep and wide; teeth of average depth and width. Flowers self-sterile, usually on plan of 6, open late; stamens reflexed. Fruit midseason or later, keeps well. Clusters large, long, broad, tapering, irregular, single-shouldered, compact; pedicel short, slender with small warts; brush short, thick, with red tinge. Berries small, variable in size, round, purplish-black, glossy with purplish-red pigment, astringent; flesh dull white with faint red tinge, translucent, tender, melting, spicy, vinous, sweet; good. Seeds free, 2-5, long, pointed, yellowish-brown.

AMINIA. *V. Labrusca* × *V. vinifera.* Aminia is one of the best early grapes, its season being with Moore Early or a little later. The grapes are of high quality and attractive appearance, but the bunches are small, variable in size, not well formed, and the berries ripen unevenly. The vine is vigorous, but is neither so hardy nor so productive as a commercial variety should be. The variety is one of Rogers' seedlings, named in 1867.

Vine vigorous, precariously hardy, lacking in productiveness. Canes rough, long, thick, dark brown; nodes enlarged; internodes long, tendrils intermittent, long, trifid or bifid, persistent. Leaves large; lobes 3; terminal lobe acute; petiolar sinus deep, narrow, often closed and overlapping; basal sinus shallow, narrow; teeth shallow, wide. Flowers open in midseason; self-sterile; stamens reflexed. Fruit early, keeps well. Clusters small, broad, irregular, conical, sometimes with a long shoulder, loose; pedicel long, with few warts; brush short, thick, brownish-red. Berries variable, round, dull black with thin bloom, persistent, firm; skin thick, tender, adherent, with purplish-red pigment, astringent; flesh greenish, translucent, tender, solid, coarse, foxy; good. Seeds adherent, 1-6, very large.

AUGUST GIANT. *V. Labrusca* × *V. vinifera.* August Giant is a hybrid between Labrusca and Vinifera in which the fruit characters are those of the latter species. In appearance and taste, the berry resembles that of Black Hamburg. The vine is usually vigorous and, considering its parentage, very hardy. The foliage is thick and luxuriant, and the quality of the fruit makes the variety desirable for the amateur. The crop needs a long-maturing season. August Giant was grown by N. B. White, Norwood, Massachusetts, in 1861.

Vine very vigorous, hardy, subject to mildew. Canes long, numerous, thick, dark brown; nodes enlarged, flattened; internodes short; tendrils continuous, long, bifid or trifid. Leaves large, thick; lobes 3, terminal one acute; petiolar sinus deep, narrow, frequently closed and overlapping; lateral sinus shallow or a notch; teeth shallow, narrow. Flowers open in midseason, self-sterile; stamens reflexed. Fruit midseason, keeps well. Clusters of average size, short, broad, irregularly tapering, single-shouldered, loose; pedicel long, thick, with large warts; brush short, thick, green or with brown tinge. Berries large, oval, purplish-red or black, dull with thick bloom, firm; skin tough, adherent, astringent; flesh green, translucent, tough, stringy, good. Seeds adherent, 1-4, large, blunt, light brown.

BACCHUS. *V. vulpina* × *V. Labrusca.* Bacchus is an offspring of Clinton, which it resembles in vine- and leaf-characters, but surpasses in quality of fruit and in productiveness of vine. The special points of merit of the variety are: resistance to cold; resistance to phylloxera; freedom from fungi and insects; productiveness; ease of multiplication; and capacity to bear grafts. Its limitations are: poor quality for table use; inability to withstand dry soils or droughts; and non-adaptability to soils containing much lime. The variety originated with J. H. Ricketts, Newburgh, New York, and was first exhibited by him in 1879.

Vine very vigorous, hardy, healthy, productive. Canes numerous, dark brown with bloom at the nodes which are enlarged and flattened; tendrils bifid. Leaves small; lobes 3, terminal one acuminate; petiolar sinus shallow, narrow, wide. Flowers open early, self-sterile; stamens upright. Fruit late, keeps well, hangs long. Clusters small, slender, uniform, cylindrical, single-shouldered, compact; pedicel short, slender, with a few warts; brush short, wine-colored. Berries small, round, black, glossy, covered with thin bloom, hang well to pedicels, firm; skin thin, adherent, contains much wine-colored pigment, slightly astringent; flesh dark green, translucent, fine-grained, tough, vinous, spicy; fair quality. Seeds clinging, 1-4, many abortive, large, short and wide, plump, sharply pointed, brown.

BAKATOR. *V. vinifera.* This is a Hungarian wine-grape, but the high quality and early season of the fruits make it a desirable table-grape in the East. Those beginning the culture of Vinifera grapes in eastern United States should include Bakator among the sorts to be tried first. The variety seems to be grown but little on the Pacific slope. The following description is made from fruit grown at Geneva, New York:

Vine medium in vigor, productive. Young leaves tinged red at edges, upper surface glossy; mature leaves large, round; lobes 5, terminal lobe acuminate; basal sinus deep, medium to narrow, closed to overlapping; lower lateral sinus deep, variable in width; upper lateral sinus deep, usually narrow; margins dentate, teeth shallow to medium deep. Flowers appear late; stamens reflexed. Fruit ripens at Geneva the first or second week in October and keeps well in storage; clusters above medium in size, medium in length, broad, frequently double-shouldered, tapering, medium to loose; berries medium to small, oval, light red becoming dark when fully ripe, with thick bloom; skin thin, tender, adherent to the pulp; flesh greenish, juicy, tender, melting, vinous, sweet; quality very good.

BARRY. Fig. 216. *V. Labrusca* × *V. vinifera.* Barry is one of the best American black grapes, resembling in berry and in flavor and keeping quality of fruit its European parent, Black Hamburg. The appearance of berry and bunch is attractive. The vine is vigorous, hardy, and productive, but susceptible to mildew. The ripening season is just after that of Concord. For the table, for winter keeping, and for the amateur, the fruits of Barry may be highly recommended. Barry was dedicated in 1869, by E. S. Rogers, who originated it,

216. Barry. (×⅓)

to Patrick Barry, distinguished nurseryman and pomologist. The variety is grown in gardens throughout the grape regions of eastern America.

Vine vigorous, hardy, productive, susceptible to mildew. Canes long, numerous, thick, dark brown with heavy bloom; nodes flattened; shoots glabrous; tendrils intermittent, bifid or trifid. Leaves large; lobes 1-3, terminus acute; petiolar sinus deep, narrow, sometimes closed and overlapping; basal sinus usually lacking; lateral sinus shallow, narrow; teeth shallow. Flowers open in midseason, self-sterile; stamens reflexed. Fruit midseason, keeps well. Clusters short, very broad, tapering, often subdividing into several parts, compact; pedicel with small warts. Berries large, oval, dark purplish-black, glossy, covered with heavy bloom, adherent; skin thin, tough, adherent; flesh pale green, translucent, tender, stringy, vinous, pleasant-flavored; good. Seeds adherent, 1-5, large, deeply notched, with enlarged neck, brown.

BELL. *V. vulpina* × ? *Willie Bell.* Bell is one of Munson's hybrids, its parents being Elvira crossed with Delaware. The characters of vine and fruit are chiefly those of Elvira, and, in particular, the grapes have the Elvira flavor, which is somewhat against them for a table grape. The fruit has the same value for wine-making as Elvira, and it is to be assumed that it will be desirable in the making of grape-juice. The variety is grown only in Texas and the neighboring states. Munson introduced Bell in 1881.

Vine a strong grower, hardy, usually producing a full crop although a shy bearer in some localities. Leaves vigorous, healthy, medium to very large. Flowers midseason, nearly fertile; stamens upright. Fruit midseason, keeps well; clusters intermediate in size and length, frequently shouldered, compact; berries rather small, round, dull green with a yellow tinge covered with heavy gray bloom, persistent; skin thin, very tender, adherent to the pulp; flesh moderately juicy and tender; sweet at the skin, tart at the center.

BERCKMANS. *V. æstivalis Bourquiniana* × *V. vulpina.* In Berckmans we have the fruit of Delaware on the vine of Clinton. The berry and bunch resemble those of Delaware in shape; the fruit is of the same color; bunch and berry are larger; the grapes keep longer; the flesh is firmer, but the quality is not so good, as the flesh lacks tenderness and richness. The vine of Berckmans is not only more vigorous, but less subject to mildew than that of Delaware. The vine-characters are not, however, so good as those of Clinton. The variety is poorly adapted to some soils, and on these the grapes do not color well. In spite of many good qualities, Berckmans is but an amateur's grape. The name commemorates the viticultural labors of P. J. Berckmans, and was given by his friend, A. P. Wylie, Chester, South Carolina, who originated the variety. Berckmans came from Delaware seed sown in 1868, fertilized by Clinton.

Vine vigorous, hardy, productive. Canes long, numerous, slender, dark brown; nodes prominent, flattened; internodes short; shoots glabrous; tendrils intermittent, long, bifid. Leaves small, thin; lobes 1-3, terminal one acute; petiolar sinus shallow, wide; basal sinus usually lacking; lateral sinus shallow. Flowers open early, self-fertile; stamens upright. Fruit ripens with Delaware. Clusters shouldered, compact, slender; pedicel long, slender with few warts; brush short, light green. Berries small, oval, Delaware-red, darker when well ripened, covered with thin bloom, persistent; skin thin, tough, adherent, astringent; flesh pale yellowish-green, translucent, fine-grained, tender, melting, vinous, sweet, sprightly; very good. Seeds free, 1-4, small, broad, blunt, brown.

BETA. *V. vulpina.* One of the hardiest of all grapes, Beta has made a place for itself in northern Wisconsin and Minnesota, where alone it is grown. The vines are not only hardy but also healthy and productive. The bunches are of medium size, while the berry is about half way in size between those of Delaware and Concord. The fruit ripens very early, and usually escapes frost even in these northern latitudes. In regions where the general run of American grapes are grown, the quality of the fruit of this variety would be considered poor, the flavor being acid and somewhat astringent. It is said, however, that the grape-juice, jelly, and culinary preparations made from fruit of Beta are most excellent in quality. The variety is probably a pure Vulpina, although some believe it to have a trace of Labrusca blood as well. It originated with a Mr. Suelter, who says it is a cross between Carver, a Vulpina grape, and Concord. The date of origin is not given. Unfortunately the writer has not seen the fruit of Beta, and cannot find a satisfactory description of it. Growers report that it is very similar in vine and fruit to the well-known Janesville.

BLACK HAMBURG. *V. vinifera.* Black Hamburg is an old European sort, long the mainstay in forcing-houses in Belgium, England, and America, and now popular out-of-doors in California. The grapes are excellent for the table and keep well, but the tender skin does not permit their being shipped far, especially when grown out-of-doors. Bunch and berry are as beautiful as in any grape that grows. The vine is subject to disease. The following description of the fruit is made from grapes grown in the greenhouse:

Bunches very large, often a foot in length and weighing several pounds; very broad at the shoulder and gradually tapering to a point; compact, oftentimes too compact; berries very large, round or slightly round-oval; skin rather thick; dark purple becoming black at full maturity; flesh firm, juicy, sweet and rich; quality very good or best. Season early in the forcing-house but rather late out-of-doors.

BLACK MALVOISE. *V. vinifera.* This variety is widely grown in California as an early table-grape and might be worth trying in eastern grape regions. While the fruit is not of the best quality, it is good. The following description is compiled:

Vine vigorous, healthy and productive; wood long-jointed, rather slender, light brown. Leaves of medium size, oval, evenly and deeply five-lobed; basal sinus open, with nearly parallel sides; upper surface smooth, almost glabrous; lower surface slightly tomentose on the veins and veinlets. Bunches large, loose, branching; berries large, oblong, reddish black with faint bloom; flesh firm, juicy, crisp; flavor lacking in richness and character; quality not high. Season early, keeping and shipping but poorly.

BLACK MOROCCO. *V. vinifera.* Black Morocco very generally meets the approval

of grape-growers on the Pacific slope, without being a prime favorite for either home use or commerce. The grapes are not high enough in quality for a home vineyard, and, while they ship well, are hard to handle because of the large size and rigidity of the bunches. Another fault is that the vines are subject to root-knot. The chief asset of the variety is handsome appearance of fruit. This variety is remarkable for the number of second-crop bunches which it produces on the laterals. The following description is compiled:

Vine very vigorous, productive; canes spreading, few. Leaves medium to small, very deeply five-lobed; the younger leaves truncate at base, giving them a semi-circular outline, with long, sharp teeth alternating with very small ones; glabrous, or nearly so, on both sides. Bunches very large, short, shouldered, compact and rigid. Berries very large, round, often misshapen from compression; dull purple, lacking color in the center of the bunch; flesh firm, crisp, neutral in flavor, lacking in richness; quality rather low. Season late, keeping and shipping well.

BRIGHTON. Fig. 217. *V. Labrusca* × *V. vinifera.* Brighton is one of the few Labrusca-Vinifera hybrids which has attained prominence in commercial vineyards. It ranks as one of the leading amateur grapes in eastern America, and is among the ten or twelve chief commercial sorts of this region. Its good points are: for the fruit, high quality; for the vine, vigorous growth, productiveness, adaptability to various soils, and ability to withstand fungi. Brighton has two serious defects which keep it from taking higher rank as a commercial variety: the fruits deteriorate in quality very quickly after maturity, so that they cannot be kept for more than a few days at best, hence cannot be shipped to distant markets; and the flowers are self-sterile to a more marked degree than in any other commonly-grown grape. Brighton is a seedling of Diana Hamburg pollinated by Concord, raised by Jacob Moore, Brighton, New York. The original vine fruited first in 1870.

217. Brighton. (×⅓)

Vine vigorous, hardy, productive, subject to mildew. Canes long, numerous, light brown; nodes enlarged, usually flattened; internodes long; tendrils continuous, long, bifid. Leaves large, thick; lobes 3 when present, terminal one acute; petiolar sinus intermediate in depth and width; lateral sinus shallow; teeth narrow. Flowers open late, self-sterile; stamens reflexed. Fruit midseason. Clusters large, long, broad, tapering, heavily shouldered, loose; pedicel thick; brush pale green with brown tinge, thick, short. Berries irregular, large, oval, light red, glossy with heavy bloom, persistent, soft; skin tnick, tender, adherent, astringent; flesh green, transparent, tender, stringy, melting, aromatic, vinous, sweet; very good. Seeds free, 1-5, broad, light brown.

BRILLIANT. (*V. Labrusca* × *V. vinifera*) × *V. æstivalis Bourquiniana.* Brilliant is a cross between Lindley and Delaware. In cluster and size of berry, it resembles Lindley; in color and quality of fruit it is about the same as Delaware, differing chiefly in having more astringency in the skin. Its season is about the same as that of Delaware. The grapes do not crack or shell, therefore ship well, and have very good keeping qualities, especially on the vine, where they often hang for weeks. The vine is vigorous and hardy. The defects which have kept Brilliant from becoming one of the standard commercial sorts are: marked susceptibility to fungi, variability in size of cluster, unevenness in ripening and in productiveness. In favorable situations this variety pleases the amateur, and the commercial grower often finds it profitable. The seed which produced Brilliant was planted by T. V. Munson, Denison, Texas, in 1883.

Vine vigorous, hardy, rather unproductive. Canes long, numerous, thick, dark brown; nodes enlarged, flattened; internodes long; tendrils intermittent, long, bifid. Leaves large, thick; obscurely three-lobed with terminal lobe acute; petiolar sinus deep, narrow; basal and lateral sinuses obscure and shallow when present; teeth intermediate in depth and width. Flowers open late, self-fertile; stamens upright. Fruit early midseason, keeps well. Clusters medium, blunt, cylindrical, usually shouldered, compact; pedicel short, thick, with a few warts; brush short, thick, pale green with reddish tinge. Berries round, dark red, glossy with thin bloom, strongly adherent, firm; skin thin, tough, adherent; flesh pale green, transparent, juicy, stringy, fine-grained, vinous, sweet; good. Seeds clinging, 1-4, large, broad, elongated, plump, light brown.

CACO. *V. Labrusca.* Caco, said to be a cross between Catawba and Concord, is one of the most recent varieties, and is now on probation in many vineyards throughout the country. The variety was awarded a medal by the American Institute of New York, and is spoken of in superlative terms by nurserymen. On the grounds of the New York Agricultural Experiment Station, however, the variety is a failure, not equaling either parent in any of the characters of the fruit, except in size of berries, which are larger than those of either Concord or Catawba. The fruits are more of the Catawba type than of the Concord, resembling Catawba somewhat in color, but are not so bright, and the flavor is not so good. The grapes do not ripen very uniformly, and the clusters are too small for a commercial grape. The variety was introduced by the J. T. Lovett Company in 1911.

Vine rather vigorous, hardy, fairly productive. Fruit midseason, ripening with Concord; clusters of medium size, slender, cylindrical, rather loose; brush pale green; berries large, round, variable in size and shape, color dull red similar to that of Catawba; bloom heavy; skin thick, tough, parting readily from the flesh; flesh greenish-white, transparent, firm, juicy, tender, flavor somewhat like that of Lindley but milder, sweet; quality good; seeds 3 or 4, rather large, separating readily from the flesh.

CAMPBELL EARLY. Fig. 218. *V. Labrusca* × *V. vinifera.* The meritorious qualities of Campbell Early are: the grapes are high in quality when mature; free from foxi-

ness and from acidity about the seeds; have small seeds which easily part from the flesh; are early, ripening nearly a fortnight before Concord; bunch and berry are large and handsome; and the vines are exceptionally hardy.

218. Campbell Early. (×⅓)

Campbell Early falls short in not being adapted to many soils; the variety lacks productiveness; the grapes attain full color before they are ripe, and are, therefore, often marketed in an unripe condition; the bunch is variable in size; and the color of the berry is not attractive. George W. Campbell, Delaware, Ohio, grew this variety from a seedling of Moore Early pollinated by a Labrusca-Vinifera hybrid. It bore first in 1892.

Vine vigorous, hardy, productive. Canes thick, dark reddish-brown, surface roughened with small warts; nodes flattened; internodes short; shoots pubescent; tendrils intermittent, short, bifid or trifid. Leaves large, thick; lobes 3, usually entire, terminal one acute; petiolar sinus shallow, wide, basal sinus pubescent; lateral sinus wide or a notch; teeth shallow, narrow. Flowers self-fertile, open in midseason; stamens upright. Fruit early, keeps and ships well. Clusters usually large, long, broad, tapering, single-shouldered; pedicel short, slender, with small warts; brush long, light wine color. Berries usually large, round, oval, dark purplish-black, dull with heavy bloom, persistent, firm; skin tough, thin, adherent with dark red pigment, astringent; flesh green, translucent, juicy, coarse, vinous, sweet from skin to center; good. Seeds free, 1-4, light brown, often with yellow tips.

CANADA. *V. vulpina* × *V. vinifera.* Canada is considered the most desirable hybrid between Vulpina and Vinifera. The variety shows Vinifera more than Vulpina parentage: thus, in susceptibility to fungal diseases; in shape, color, and texture of foliage; in the flavor of the fruit; and in the seeds, there are marked indications of Vinifera; while the vine, especially in the slenderness of its shoots and in the bunch and berry, shows Vulpina. The fruits have little value for dessert, but make very good red wine and grape-juice. Canada is a seedling of Clinton, a Labrusca-Vulpina hybrid, fertilized by Black St. Peters, a variety of Vinifera. Charles Arnold, Paris, Ontario, planted the seed which produced Canada in 1860.

Vine very vigorous, hardy, productive. Canes long, numerous, slender, ash-gray, reddish-brown at nodes with heavy bloom; nodes enlarged; internodes short; tendrils intermittent, short, trifid or bifid. Leaves thin; terminal lobe acute; petiolar sinus deep, narrow; basal sinus variable in depth and width; lateral sinus deep and narrow; teeth deep and wide. Flowers self-sterile, early; stamens upright. Fruit midseason, keeps well. Clusters long, slender, uniform, cylindrical, compact; pedicel long, slender, smooth; brush short, light brown. Berries small, round, purplish-black, glossy with heavy bloom, persistent, firm; skin thin, tough, adherent; flesh dark green, very juicy, fine-grained, tender, spicy, pleasant vinous flavor, agreeably tart; good. Seeds free, 1-3, blunt, light brown.

CARMAN. *V. æstivalis Lincecumii* × ? Carman has not become popular with growers, chiefly because the grapes ripen very late and are not of high quality. The most valuable character of the fruits is that of long keeping, whether hanging on the vine or after harvesting. T. V. Munson, Denison, Texas, raised Carman from seed of a wild post-oak grape taken from the woods, pollinated with mixed pollen of Triumph and Herbemont. It was introduced in 1892.

Vine very vigorous, hardy, rather productive. Canes long, numerous, thick, reddish-brown; nodes enlarged, flattened; internodes long; tendrils intermittent, long, trifid. Leaves large, thick; terminal lobe acute; petiolar sinus deep; basal sinus absent or shallow; lateral sinus shallow when present. Flowers self-fertile or nearly so, open very late; stamens upright. Fruit late, keeps well. Clusters variable in size, tapering, single-shouldered, compact; pedicel short, slender, smooth; brush short, slender, wine-colored. Berries small, round, slightly oblate, purplish-black, glossy, covered with heavy bloom, persistent, firm; skin thin, tough, free; flesh yellowish-green, tender, post-oak flavor, vinous, spicy; good to very good. Seeds free, 1-4, small, blunt, brown.

CATAWBA. Fig. 219. *V. Labrusca* × *V. vinifera. Arkansas. Cherokee. Fancher. Lebanon. Lincoln. Michigan. Muncy. Omega. Saratoga. Singleton. Tokay. Virginia.* Catawba has long been the standard red grape in the markets of eastern America, chiefly

219. Catawba. (×⅓)

because the fruit keeps well and is of high quality. The vine is vigorous, hardy, and productive, but the foliage and fruit are susceptible to fungi. These two faults account for the decline of Catawba in grape regions in the United States and for its growing unpopularity. The characters of Catawba seem readily transmissible to its offspring; besides having a number of pure-bred descendants which more or less resemble it, it is a parent of a still greater number of cross-breeds. As

with Catawba, most of its progeny show Vinifera characters, as intermittent tendrils, Vinifera color of foliage, a vinous flavor wholly or nearly free from foxiness, and the susceptibilities of Labrusca-Vinifera hybrids to certain diseases and insects. Catawba was introduced by John Adlum, District of Columbia, about 1823. Adlum secured cuttings from a Mrs. Scholl, Clarksburgh, Montgomery County, Maryland, in the spring of 1819. Its further history is not known.

Vine vigorous, hardy, productive. Canes numerous, thick, dark brown; nodes enlarged; tendrils continuous, bifid or trifid. Leaves large; lobes sometimes 3, terminal one acute; petiolar sinus often lacking; lateral sinus narrow; teeth shallow, narrow. Flowers self-sterile, open late, stamens upright. Fruit late, keeps well. Clusters large, long, broad, tapering, single- or sometimes double-shouldered, loose; pedicel with a few inconspicuous warts; brush short, pale green. Berries of medium size, oval, dull purplish-red with thick bloom, firm; skin thick, adherent, astringent; flesh green, translucent, juicy, fine-grained, vinous, sprightly, sweet and rich; very good. Seeds free, frequently abortive, 2, broad-necked, distinctly notched, blunt, brown.

CHAMPION. *V. Labrusca. Beaconsfield. Early Champion. Talman's Seedling.* Champion is a favorite early grape with some growers, although the poor quality of the fruit should have driven it from cultivation long ago. The characters which have kept it in the market are earliness, good shipping qualities, attractive appearance of fruit, and a vigorous, productive, hardy vine. The hardiness of the vine and the short season of fruit development make it a good variety for northern climates. This grape is best in appearance of fruit, in quality, and in the quantity produced, on light sandy soils. The origin of Champion is unknown. It was first grown about 1870 in New York.

Vine very vigorous, hardy and productive. Canes of average size, dark brown; nodes enlarged, flattened; internodes short; shoots pubescent; tendrils continuous, long, bifid. Leaves large; lobes usually 3, often obscurely 5, terminal one acute; petiolar sinus deep; teeth shallow. Flowers self-fertile, early; stamens upright. Fruit early, 3 weeks before Concord, season short. Clusters medium in size, blunt, cylindrical, usually not shouldered, compact; pedicel short with inconspicuous warts; brush white tinged with bronze. Berries medium in size, round, dull black covered with heavy bloom, soft; skin thick, tender, adherent, astringent; flesh light green, translucent, juicy, fine-grained, tender, foxy; poor in quality. Seeds adherent, 1-5, broad, long, blunt, light brown.

CHASSELAS GOLDEN. *V. vinifera. Chasselas Dore. Fontainebleau. Sweetwater.* Several qualities have made Chasselas Golden a favorite grape wherever it can be grown. The variety is adapted to widely differing environments; the season of ripening is early; while not choicely high, the quality of the grapes is good and they are beautiful—clear green tinged with golden bronze where exposed to the sun. Chasselas Golden is a popular variety on the Pacific slope, and should be one of the first Viniferas to be tried in the East. The following description was made from fruit grown at Geneva, New York:

Vine medium in vigor, very productive; buds open in midseason. Young leaves tinged with red on both upper and lower surfaces, thinly pubescent to glabrous; mature leaves medium to above in size, slightly cordate; lobes 5, terminal lobe acuminate; basal sinus broad and rather deep; lower lateral sinus variable, usually broad and sometimes deep; upper lateral sinus broad and frequently deep; teeth large, obtuse to rounded. Flowers late; stamens upright. Fruit ripens early and keeps well in storage. Clusters large, long, broad, tapering, sometimes with a single shoulder, compactness medium. Berries medium to above, slightly oval, pale green to clear yellow, with thin bloom; skin thin, tough, adherent, slightly astringent; flesh greenish, translucent, firm, juicy, tender, sweet; good.

CHASSELAS ROSE. *V. vinifera.* Chasselas Rose is very similar to Chasselas Golden, the fruits differing chiefly in smaller bunch and berry and slightly different flavor, which is possibly better. It is a standard sort in California and should be planted in the East where the culture of Viniferas is attempted. The description is made from fruit grown at Geneva, New York.

Vine of medium vigor, productive. Opening leaves tinged with red on both surfaces, mature leaves small, round; lobes 3; basal sinus medium in depth and of variable width; lateral sinus deep, narrow; teeth shallow, wide. Flowers appear late; stamens upright. Fruit ripens the second week in October and is a good keeper though it loses its flavor in storage. Clusters above and below medium, long, tapering to cylindrical, compact. Berries medium in size, roundish oval, light red changed to violet-red by the bloom; skin thin, astringent, juicy, tender, sweet, mild; quality good.

CLEVENER. *V. vulpina* × *V. Labrusca.* The fruit of Clevener is remarkable in coloring very early and in ripening late. The vine is hardy, very vigorous, succeeds in various soils, and, since it bears grafts well, is an excellent sort upon which to graft varieties not thriving on their own roots. Clevener is self-sterile and must be planted with some other variety to set fruit well. In spite of its good qualities, Clevener is hardly holding its own in commercial vineyards, and is not a desirable fruit for the amateur who wants a table-grape. Clevener has been raised in the vicinity of Egg Harbor, New Jersey, since about 1870, but its place and time of origin are unknown.

Vine a rampant grower, hardy, productive. Canes long, numerous, thick, dark reddish-brown with heavy bloom; nodes enlarged; tendrils continuous, bifid. Leaves unusually large; lobes wanting or faint; teeth deep, wide. Flowers self-sterile, open very early; stamens reflexed. Fruit late, keeps well. Clusters do not always fill well, small, short, slender, irregularly tapering, often with a single shoulder. Berries small, round or slightly flattened, black, glossy, covered with heavy bloom, persistent, firm; skin tough, thin, inclined to crack, adherent, with much purplish-red pigment; flesh reddish-green, juicy, tender, soft, fine-grained, aromatic, spicy; good. Seeds free, notched, sharp-pointed, dark brown.

CLINTON. *V. vulpina* × *V. Labrusca. Worthington.* Clinton came into prominence because of vigor, hardiness, fruitfulness, and immunity to phylloxera. A serious defect is that the vines bloom early and in northern climates the blossoms are often caught by late frosts. Other defects are: the fruit is small and sour, and the seeds and skins are prominent. The fruit colors early in the season, but does not ripen until late, a slight touch of frost im-

proving the flavor. Clinton bears grafts well, making a quick and firm union with Labrusca and Vinifera, and the vines are easily propagated from cuttings. The offspring of Clinton are usually very hardy, and this fact, taken with its other desirable characters, makes it an exceptionally good starting-point for breeding grapes for northern latitudes. Clinton is an old sort, the Worthington, known as early as 1815, renamed; it began to attract attention about 1840.

Vine vigorous, hardy, healthy, productive. Canes long, numerous, slender, reddish-brown; nodes enlarged, flattened; shoots smooth; tendrils intermittent, sometimes continuous, bifid. Leaves hang until late in the season, small, thin; petiolar sinus deep, narrow, urn-shaped; basal and lateral sinuses shallow; teeth wide. Flowers self-fertile, open early; stamens upright. Fruit midseason. Clusters small, slender, cylindrical, uniform, single-shouldered, compact; pedicel short, very slender, smooth; brush tinged with red. Berries small, round, oval, purplish-black, glossy, covered with thick bloom, adherent, firm; skin very thin, tough, free from pulp with much wine-colored pigment, astringent; flesh dark green, juicy, fine-grained, tough, solid, spicy, sour, vinous. Seeds adherent, 2, short, blunt, brownish.

COLERAIN. *V. Labrusca.* This is one of the numerous seedlings of Concord, bearing white grapes. The vine has the characteristic foliage and habit of growth of its parent, but the fruit is earlier by a week, is of much higher quality, and lacks the foxiness of most Labruscas. The grapes are sprightly and vinous, and neither seeds nor skin are so objectionable as in the parent. The fruit hangs well to the vine and keeps well, but owing to tender pulp does not ship well. The variety is unproductive in some localities. Colerain is worthy a place in home vineyards. David Bundy, Colerain, Ohio, grew this variety from seed of Concord planted in 1880.

Vine vigorous, hardy, healthy, unproductive. Canes slender, dark reddish-brown; nodes flattened; internodes short, bifid. Leaves thick; leaf not lobed, terminus acute; petiolar sinus wide; basal and lateral sinus very shallow when present; teeth shallow. Flowers self-fertile, opening in midseason; stamens upright. Fruit early. Clusters medium in size and length, slender, blunt, tapering, irregular, strongly shouldered, compact; pedicel slender, smooth; brush green. Berries round, light green, glossy with thin bloom, persistent; skin unusually thin, tender, adherent, unpigmented, astringent; flesh pale green, translucent, juicy, fine-grained, tender, soft, vinous, sweet; good. Seeds free, 1-3, small, broad, notched, short, plump, brown.

CONCORD. Fig. 220. *V. Labrusca.* Concord is the most widely known of the grapes of this continent, and, with its offspring, pure-bred and cross-bred, furnishes 75 per cent of the grapes of eastern America. The preëminently meritorious character of Concord is that it adapts itself to varying conditions. A second character which commends Concord is fruitfulness; the vine bears large crops year in and year out. Added to these points of superiority are hardiness, ability to withstand the ravages of diseases and insects, comparative earliness, certainty of maturity in northern regions, and fair size and handsome appearance of bunch and berry. The variety is not, however, without faults: the quality is not high, as the grapes lack richness, delicacy of flavor and aroma, and have a foxy taste disagreeable to many; the seeds and skin are objectionable, as the seeds are large and abundant and difficult to separate from the flesh, and the skin is tough and unpleasantly astringent; the grapes do not keep nor ship well, and rapidly lose flavor after ripening; the skin cracks and the berries shell from the stems after picking; and the vine is but slightly resistant to phylloxera. While Concord is grown in the South, it is essentially a northern grape, which becomes susceptible to fungi in southern climates and suffers from phylloxera in dry, warm soils. Seeds of a wild grape were planted in the fall of 1843 by E. W. Bull, Concord, Massachusetts, from which plants fruited in 1849. One of these seedlings was named Concord.

220. Concord. (×⅓)

Vine vigorous, hardy, healthy, productive. Canes long, thick, dark reddish-brown; nodes enlarged, flattened; internodes long; shoots pubescent; tendrils continuous, long, bifid, sometimes trifid. Leaves large, thick; lobes 3 when present, terminal one acute; petiolar sinus variable; basal sinus usually lacking; lateral sinus obscure and frequently notched; teeth shallow, narrow. Flowers self-sterile, open in midseason; stamens upright. Fruit midseason, keeps from 1-2 months. Clusters uniform, large, wide, broadly tapering, usually single-shouldered, sometimes double-shouldered, compact; pedicel thick, smooth; brush pale green. Berries large, round, glossy, black, with heavy bloom, firm; skin tough, adherent with a small amount of wine-colored pigment, astringent; flesh pale green, translucent, juicy, fine-grained, tough, solid, foxy; good. Seeds adherent, 1-4, large, broad, distinctly notched, plump, blunt, brownish.

COTTAGE. *V. Labrusca.* In vine and fruit, Cottage resembles its parent, Concord, having, however, remarkably large, thick, leathery leaves. It is noted also for its strong, branching root system and canes so rough as to be almost spiny. The fruit is better in quality than that of its parent, having less foxiness and a richer, more delicate flavor. The crop ripens from one to two weeks earlier than that of Concord. The good qualities of the variety are offset by comparative unproductiveness of the vine, and unevenness in the ripening of the crop. Cottage is recommended for the garden as an early grape of the Concord type. This variety was grown from seed of Concord by E. W. Bull, Concord, Massachusetts. It was introduced in 1869.

Vine vigorous, healthy, hardy. Canes rough, hairy, long, numerous, dark brown; nodes enlarged; shoots very pubescent; tendrils continuous, bifid. Leaves large, thick; leaf entire with terminus acute; petiolar sinus deep and wide; teeth shallow, wide. Flowers self-sterile,

open early; stamens upright. Fruit does not keep well. Clusters of medium size, broad, cylindrical, sometimes single-shouldered, compact; pedicel short, thick, with a few small warts; brush dark red. Berries of medium size, round, dull black with heavy bloom, drop badly from pedicel, firm; skin thick, tender, adherent with dark purplish-red pigment, astringent; flesh juicy, tough, solid, foxy; good. Seeds free, 1-4, large, broad, blunt, light brown.

CREVELING. *V. Labrusca* × *V. vinifera. Bloom. Bloomburg. Catawissa. Columbia Bloom.* Creveling was long a favorite black grape for the garden, where, if planted in good soil, it produces fine clusters of large, handsome, very good grapes. Under any but the best of care, however, the vine is unproductive and sets loose, straggling bunches. The flowers are markedly self-sterile. The origin of Creveling is uncertain. It was introduced about 1857 by F. F. Merceron, Catawissa, Pennsylvania.

Vine vigorous, not hardy, often unproductive. Canes long, numerous, thick, reddish-brown; nodes enlarged, flattened; internodes long; shoots glabrous; tendrils continuous, long, trifid or bifid. Leaves large, thick; lobes 3, or obscurely 5, terminal one acute; petiolar sinus shallow, narrow; teeth shallow. Flowers on plan of 6, self-sterile, open in midseason; stamens reflexed. Fruit early, does not keep well. Clusters long, broad, irregularly tapering, single-shouldered, the shoulder often connected to the cluster by a long stem, loose; brush thick, dark wine-color. Berries large, oval, dull black, covered with heavy bloom, persistent, firm; skin thick, tough, adherent with wine-colored pigment, astringent; flesh pale green, translucent, juicy, stringy, tender, coarse, foxy; good. Seeds free, 1-5, broad, notched, blunt, light brown.

CROTON. *V. æstivalis Bourquiniana* × *V. vinifera.* The fruit of Croton is a feast both to the eye and to the palate. Unfortunately, the vine is difficult to grow, as it is adapted to but few soils and proves unfruitful, weak in growth, precariously tender, and subject to mildew and rot in unfavorable situations. The grapes have a delicate, sweet Vinifera flavor, with melting flesh which readily separates from the few seeds. The crop hangs on the vines until frost and keeps well into the winter. In spite of high quality of fruit, Croton has never become widely distributed, and wholly fails as a commercial variety. It originated with S. W. Underhill, Croton Point, New York. Fruits were first exhibited in 1868.

Vine vigorous, tender, productive. Canes long, numerous, thick, dark reddish-brown; nodes enlarged; internodes short; shoots glabrous; tendrils intermittent, long, bifid. Leaves of medium size, hang late; lobes 5, terminal one blunt; basal sinus narrow; lateral sinus deep and narrow; petiolar sinus narrow, often closed and overlapping; teeth shallow, wide. Flowers self-fertile, open late; stamens upright. Fruit midseason, keeps well. Clusters uniform, very large, long, slender, irregularly tapering with heavy shoulder, very loose; pedicel long, thick with inconspicuous warts; brush green. Berries irregular in size, round-elongated, yellowish-green with thin bloom, persistent, soft; skin thin, tough, adherent, unpigmented; flesh green, transparent, very juicy, melting, vinous, pleasant, agreeably sweet; very good. Seeds free, 1-3, elongated, notched, sharply pointed.

CYNTHIANA. *V. æstivalis* × *V. Labrusca.* There is controversy as to whether this variety differs from Norton. The two ripen their crops at separate times, and the fruits differ a little, so that they must be considered as distinct. Cynthiana is particular as to soil and location, preferring sandy loams, and does not thrive on clays or limestones. While very resistant to phylloxera, this variety is not much used as a resistant stock because it is not easily propagated. The vines are resistant to mildew, black-rot, and anthracnose, and are strong, vigorous growers. The cycle of vegetation for Cynthiana is long, since the buds burst forth early, and the crop matures very late. The fruits have no value as table-grapes, but in the South make the best red wine, and no doubt, will make good grape-juice. Cynthiana was received about 1850 by Prince, of Flushing, Long Island, from Arkansas.

Vine vigorous, hardy, healthy, productive. Canes medium in length, numerous, reddish-brown with thick bloom; nodes enlarged; internodes short; shoots glabrous; tendrils intermittent or continuous, bifid. Leaves thick, firm; lobes variable in number; terminal one acute; petiolar sinus deep, narrow, closed, sometimes overlapping; basal sinus shallow; lateral sinus shallow, narrow; teeth shallow; stamens upright. Fruit very late, keeps well. Clusters medium to small, long, tapering, often single-shouldered, compact; pedicel short, slender, with numerous warts; brush short, thick, wine-colored. Berries small, round, black, covered with heavy bloom, persistent, firm; skin thin, tough, adherent, with purple pigment, astringent; flesh dark green, translucent, juicy, tough, firm, spicy, tart; poor in quality. Seeds adherent, 1-6, short, blunt, dark brown.

DELAWARE. Fig. 221. *V. æstivalis Bourquiniana. French Grape. Powell. Ruff.* Delaware is used wherever American grapes are grown as the standard to gauge the quality of other grapes. In addition to high quality in fruit, the variety withstands climatic conditions to which all but the most hardy varieties succumb, is adapted to many soils and conditions, and bears in most situations an abundant crop. These qualities make it, next to Concord, the most popular grape for garden and vineyard now grown in the United States. Besides the qualities named, the grapes mature sufficiently early to make the crop certain, are attractive in appearance, keep and ship well, and are immune to black-rot. Faults of the variety are: small vine, slow growth, susceptibility to mildew, capriciousness in certain soils, and small berries. Delaware succeeds best in deep, rich, well-drained, warm soils, but even on these it must have good cultivation and close pruning, and the crop must be thinned. Delaware is grown North and South, westward to the Rocky Mountains. It is now proving profitable in many southern locations as an early grape to ship to northern markets. It is an especially desirable grape to cultivate in small gardens because of its delicious, handsome fruit, its compact habit of growth, and

221. Delaware. (×⅓)

its ample and lustrous green, delicately formed leaves, which make it one of the most ornamental of grapes. Delaware can be traced to the garden of Paul H. Provost, Frenchtown, New Jersey, where it was growing early in the nineteenth century, whence it was taken to Delaware, Ohio, in 1849.

Vine weak, hardy, productive. Canes short, numerous, slender, dark brown; nodes enlarged; internodes short; tendrils intermittent, short, bifid. Leaves small; lobes 3-5 in number, terminal one acute; petiolar sinus narrow; basal sinus narrow and shallow when present; lateral sinus deep, narrow; teeth shallow. Flowers self-fertile, open late; stamens upright. Fruit early, keeps well. Clusters small, slender, blunt, cylindrical, regular, shouldered, compact; pedicel short, slender, smooth; brush light brown. Berries uniform in size and shape, small, round, light red, covered with thin bloom, persistent, firm; skin thin, tough, adherent, unpigmented, astringent; flesh light green, translucent, juicy, tender, aromatic, vinous, refreshing, sweet; best in quality. Seeds free, 1-4, broad, notched, short, blunt, light brown.

DIAMOND. *V. Labrusca* × *V. vinifera.* Few other grapes surpass Diamond in quality and beauty of fruit. When to its desirable fruit-characters are added hardiness, productiveness, and vigor of vine, the variety is surpassed by no other green grape. Diamond is a diluted hybrid between Labrusca and Vinifera, and the touch of the exotic grape is just sufficient to give the fruits the richness in flavor of the Old World grape without overcoming the refreshing sprightliness of the native fox-grapes. The plant resembles closely that of its American parent, Concord. Diamond can be grown in as great a range of latitude as Concord. Jacob Moore, Brighton, New York, grew Diamond about 1870 from Concord seed fertilized by Iona.

Vine vigorous, hardy, productive. Canes short, brown with a slight tinge of red; nodes enlarged; internodes short; tendrils intermittent, bifid. Leaves thick; lobes 3, indistinct; petiolar sinus very shallow; teeth shallow. Flowers self-fertile, open early; stamens upright. Fruit early, keeps well. Clusters medium to short, broad, blunt, cylindrical, often single-shouldered, compact; pedicel short, thick with a few inconspicuous warts; brush slender, pale green. Berries large, ovate, green with a tinge of yellow, glossy, covered with thin bloom, persistent, firm; skin thin, tough, adherent, astringent; flesh pale green, transparent, juicy, tender, melting, fine-grained, aromatic, sprightly; very good. Seeds free, 1-4, broad and long, sharp-pointed, yellowish-brown.

DIANA. *V. Labrusca* × *V. vinifera.* Diana is a seedling of Catawba, to which its fruits bear strong resemblance, differing chiefly in having lighter color, in being less pulpy and more juicy. The chief point of superiority of Diana over Catawba is its earliness, as the crop ripens ten days sooner, making possible its culture far to the north. The defects of Diana are: the vine is tender in cold winters; the grapes ripen unevenly; the berries and foliage are susceptible to fungi; and the vine is a shy bearer. Diana demands poor, dry, gravelly soil without much humus or nitrogen. On clays, loams, or rich soils the vines make a rank growth, and the fruits are few, late, and of poor quality. The vine needs to be long pruned and to have all surplus bunches removed, leaving a small crop to mature. Mrs. Diana Crehore, Milton, Massachusetts, grew Diana from seed of Catawba, planted about 1834.

Vine vigorous, doubtfully hardy, often unproductive. Canes pubescent, long, reddish-brown, covered with thin bloom; nodes enlarged, flattened; internodes long; tendrils intermittent, long, bifid. Leaves large, thick; lobes 3-5, terminal one acute; petiolar sinus deep, wide, often closed and overlapping; basal sinus shallow; lateral sinus narrow; teeth shallow. Flowers self-fertile, open in midseason; stamens upright. Fruit late, keeps well. Clusters large, broad, tapering, occasionally shouldered, compact; pedicel covered with small warts; brush slender, pale green. Berries medium in size, slightly ovate, light red covered with thin bloom, persistent, firm; skin thick, tough, slightly adherent; flesh pale green, translucent, juicy, tough, fine-grained, vinous; good. Seeds adherent, 1-3, light brown.

DOWNING. *V. Labrusca* × *V. vinifera.* Downing is well worthy of a place in the garden because of the high quality, handsome appearance, and good keeping qualities of the grapes. Added to these qualities of the fruits are fair vigor and health of vine. When grown as far north as New York, the vine should be laid down in the winter or receive other protection. In most seasons, unremitting warfare must be kept up to check mildew. In appearance of bunch and berry, Downing is distinct, the clusters being large and well-formed, and the berries having the oval shape of a Malaga. The flesh, also, shows *V. vinifera* in texture and quality, while neither seeds nor skins are so objectionable as in pure-bred American varieties. J. H. Ricketts, Newburgh, New York, first grew Downing about 1865.

Vine tender to cold, unproductive. Canes short, few, slender, dark green with an ash-gray tinge, surface covered with thin bloom, often roughened with a few small warts; nodes much enlarged, strongly flattened; internodes short; tendrils intermittent, bifid or trifid. Leaves small, round, thick; lobes 1-5, terminal lobe acute; petiolar sinus narrow, closed and overlapping; basal sinus shallow and narrow when present; lateral sinus shallow, narrow; teeth wide, deep. Flowers open late; stamens upright. Fruit late, keeps until spring. Clusters large, long, slender, cylindrical, sometimes loosely shouldered; pedicel slender, green. Berries large, markedly oval, dark purplish-black, glossy, covered with light bloom, strongly persistent, firm; skin thick, tender, adherent; flesh green with a yellow tinge, translucent, very juicy, tender, fine-grained, vinous, mild; very good in quality. Seeds free, 1-3, notched, long, brown.

DRACUT AMBER. *V. Labrusca.* Dracut Amber is representative of the red type of Labrusca. The fruit has no particular merit; its thick skin, coarse pulp, seeds, and foxy taste all are objectionable. However, the vine is very hardy and productive, and ripens its fruit early, so that this variety becomes valuable in locations where a vigorous, hardy, early grape is wanted. Asa Clement, Dracut, Massachusetts, grew Dracut Amber from seed planted about 1855.

Vine vigorous, hardy, productive. Canes long, numerous, dark brown; nodes enlarged, flattened; tendrils continuous, long, bifid or trifid. Leaves large, thick; lobes 3-5, with terminal one obtuse; petiolar sinus deep, narrow; basal sinus shallow, wide; teeth shallow. Flowers on plan of 6, semi-fertile, midseason. Fruit early, season short. Clusters short, broad, cylindrical, irregular, rarely shouldered, compact; pedicel short, covered with warts; brush long, light yellowish-green.

Berries medium to large, oval, dull pale red or dark amber, covered with thin bloom, soft; skin very thick, tender, adherent, astringent; flesh green, translucent, juicy, tough, very foxy; inferior in quality. Seeds adherent, 2-5, large, broad, light brown.

DUTCHESS. Fig. 222. *V. Labrusca* × ? Dutchess is not grown largely in commercial vineyards because of several faults: the vine is tender to cold; the berries do not ripen evenly; berries and foliage are susceptible to fungi; and, in soils to which the variety is not adapted, berries and bunches are small. In spite of these defects, Dutchess should not be discarded by the grape-lover, for there are few grapes of higher quality. The grapes are sweet and rich, yet do not cloy the appetite; although of but medium size, they are attractive, having a beautiful amber color with distinctive dots; the flesh is translucent, sparkling, fine-grained, and tender; the seeds are small, few, and part readily from the pulp; the skin is thin, yet tough enough for good keeping; and the bunches are large and compact when well grown. The variety is self-fertile, and, therefore, desirable when only a few vines are wanted. A. J. Caywood, Marlboro, New York, grew Dutchess from seed of a white Concord seedling planted in 1868.

222. Dutchess. (×⅓)

Vine vigorous, an uncertain bearer. Canes dark brown with light bloom, surface roughened; nodes enlarged, flattened; internodes short; tendrils intermittent, short, bifid or trifid. Leaves irregular in outline; leaf entire with terminus acute; petiolar sinus narrow; basal sinus shallow when present; lateral sinus medium in depth or a mere notch. Flowers self-fertile, open late; stamens upright. Fruit midseason, keeps and ships well. Clusters large, long, slender, tapering with a prominent single shoulder; pedicel slender, smooth; brush amber-colored. Berries of medium size, round, pale yellow-green verging on amber, some showing bronze tinge with thin bloom, persistent, firm; skin sprinkled with small dark dots, thin, tough, adherent; flesh pale green, translucent, juicy, fine-grained, tender, vinous, sweet, of pleasant flavor; quality high. Seeds free, 1, 2 or occasionally 3, small, short, sharp-pointed, brown.

EARLY DAISY. *V. Labrusca.* The qualities of Early Daisy make the variety better than commonplace. Its early fruits commend it, for the ripening period is eight or ten days earlier than that of Champion or Moore Early, making it one of the very earliest sorts. For a variety maturing its crop so early, the grapes both keep and ship well. Early Daisy is quite as desirable as Hartford or Champion, and for a home vineyard more so. The variety originated with John Kready, Mount Joy, Pennsylvania, in 1874.

Vine vigorous, hardy, produces fair crops. Canes of medium length, numerous, slender, reddish-brown; nodes enlarged, flattened; tendrils continuous, bifid. Leaves small, light green; cobwebby; lobes wanting or faintly 3; petiolar sinus deep, narrow; teeth shallow, narrow. Flowers nearly self-sterile. Fruit early. Clusters small to medium, often blunt at ends, cylindrical, sometimes single-shouldered, compact; pedicels short, slender, smooth; brush reddish, slender. Berries of medium size, round, dull black, covered with heavy bloom, persistent; skin tough, purplish-red pigment; flesh tough, solid, aromatic, tart at the skin, acid at center; inferior in flavor and quality. Seeds numerous, adherent, of average size, dark brown.

EARLY OHIO. *V. Labrusca.* Early Ohio is remarkable, chiefly, in being one of the earliest commercial grapes. The fruit resembles that of Concord, of which it is probably a seedling. Notwithstanding many defects, Early Ohio is grown somewhat commonly, although its culture is on the wane. The variety was found in 1882 by R. A. Hunt, Euclid, Ohio, between rows of Delaware and Concord.

Vine weak, tender, usually unproductive. Canes short, slender, brown with a red tinge; nodes enlarged, flattened; internodes short; tendrils continuous, short, bifid. Leaves intermediate in size; lobes wanting or 1-3, terminal one acute; petiolar sinus shallow, wide; basal sinus usually absent; lateral sinus shallow, narrow; teeth shallow. Flowers self-fertile, open in midseason; stamens upright. Fruit very early, does not keep well. Clusters medium in size, tapering; pedicel slender with a few small warts; brush slender, tinged with red. Berries variable in size, round, purplish-black, glossy with heavy bloom, persistent, firm; skin adherent, astringent; flesh green, translucent, juicy, tough, aromatic; poor in quality. Seeds adherent, 1-4, notched, brown with yellowish-brown tips.

EARLY VICTOR. *V. Labrusca* × *V. æstivalis Bourquiniana.* The fruits of Early Victor are highest in quality of early black grapes. They are especially pleasing to those who object to the foxiness so marked in the product of Hartford and Champion. If the season were but a few days earlier, and bunch and berry a little larger, Early Victor would be the best grape with which to start the season. The vines are hardy, healthy, vigorous, and productive. The bunches are small, compact, variable in shape, and the berries are about the size and shape of those of Delaware. The grapes ripen about the same time as those of Moore Early or a little later, although, like many black grapes, the fruit colors before it is ripe, and is often picked too green. Unfortunately, the fruit is susceptible to black-rot and shrivels after ripening. John Burr, Leavenworth, Kansas, first grew Early Victor about 1871.

Vine vigorous, hardy, healthy, productive. Canes long, numerous, slender, dark brown, surface pubescent; nodes enlarged; internodes long; tendrils continuous, bifid, sometimes trifid. Leaves thick; lobes 3-5, terminal one acute; basal sinus shallow and wide when present; lateral sinus narrow. Flowers semi-sterile, open in midseason; stamens upright. Fruit very early, does not keep well. Clusters small, variable in shape, cylindrical, frequently single-shouldered, compact; pedicel short, covered with numerous small warts; brush wine-colored. Berries small, round, dark purplish-black, dull with heavy bloom, persistent; skin thin, tough, adherent, contains much red pigment, astringent; flesh greenish-white, opaque, fine-grained, aromatic, vinous; good. Seeds adherent, 1-4, broad, notched, blunt, dark brown.

EATON. *V. Labrusca.* Eaton is a pure-bred seedling of Concord, which it surpasses in appearance, but does not equal in quality of fruit. The flesh is tough and stringy, and, though sweet at the skin, is acid at the seeds, and has the same foxiness that characterizes Concord, but more juice and less richness, so that it is well described as a "diluted" Concord. The grape-skin is very similar to that of Concord, and the fruit packs, ships, and keeps about the same, perhaps not quite as well because of the greater amount of juice. The season is a few days earlier than that of Concord. The vine is similar in all characters to that of its parent. The grapes ripen unevenly, the flowers are self-sterile, and in some locations the vine is a shy bearer. The variety has not found favor with either grower or consumer. Eaton originated with Calvin Eaton, Concord, New Hampshire, about 1868.

Vine vigorous, hardy, healthy, productive. Canes thick, light brown with blue bloom; nodes enlarged, flattened; internodes short; tendrils continuous, long, bifid or trifid. Leaves large, round, thick; lobes 3, terminal one acute; petiolar sinus shallow, wide; basal sinus usually lacking; lateral sinus shallow, narrow, often notched; teeth shallow. Flowers semi-sterile, early; stamens upright. Fruit midseason. Clusters large, short, broad, blunt, sometimes double-shouldered, compact; pedicel long, thick, smooth; brush slender, pale green. Berries large, round, black with heavy bloom, persistent, firm; skin tough, adherent, purplish-red pigment, astringent; flesh green, translucent, juicy, tough, stringy, foxy; fair in quality. Seeds adherent, 1-4, broad, notched, plump, blunt.

ECLIPSE. Fig. 223. *V. Labrusca.* Eclipse is a seedling of Niagara, and, therefore, a descendant of Concord, which it resembles, differing chiefly in earlier fruit which is of better quality. Unfortunately, the bunches and berries are small. The vines are hardly surpassed by those of any other variety, being hardy, healthy, and productive, qualities that commend Eclipse for commercial vineyards. The ripe grapes hang on the vines for some time without deterioration, and do not crack in wet weather. The crop ripens several days earlier than that of Concord. Eclipse originated with E. A. Riehl, Alton, Illinois, from seed planted about 1890.

223. Eclipse. (×⅓)

Vine vigorous, hardy, productive. Canes medium in length, dark reddish-brown; nodes enlarged; tendrils continuous, long, bifid. Leaves large; lobes wanting or 3 with terminal one acute; petiolar sinus narrow, often notched; teeth shallow, narrow. Flowers self-sterile, open in midseason; stamens reflexed. Fruit early, keeps well. Clusters of medium size, broad, tapering, frequently single-shouldered, compact; pedicel short, thick, covered with small warts; brush long, pale green. Berries large, oval, dull black with abundant bloom, persistent, firm; skin tender, fine-grained, foxy, sweet; good. Seeds free, 1-4, short, broad, distinctly notched, blunt, brown.

EDEN. *V. rotundifolia* × *V. Munsoniana.* Eden is of value as a general-purpose grape for the South, and is interesting as one of the few supposed hybrids with *V. rotundifolia.* It is probably a hybrid between the species named and *V. Munsoniana,* another southern wild grape. The vine is exceedingly vigorous and productive and thrives on clay soils, whereas most other Rotundifolias can be grown successfully only on sandy lands. Eden was found some years ago on the premises of Dr. Guild, near Atlanta, Georgia.

Vine very vigorous, productive, healthy and bearing a dense canopy of foliage. Canes darker in color than most other Rotundifolias. Leaves of medium size and thickness, longer than wide; petiolar sinus wide; marginal teeth rounded; leaf-tip blunt. Flowers perfect. Fruit early, distinct first and second crops, ripens uniformly. Clusters large, loose, bearing from five to twenty-five berries which adhere fairly well to the pedicels. Berries round, ½ inch in diameter, dull black, faintly specked; skin thin, tender; flesh soft, juicy, pale green, sprightly; good in quality.

ELVIRA. *V. vulpina* × *V. Labrusca.* Although it has never attained popularity in the North, Elvira, after its introduction into Missouri about forty years ago, reached the pinnacle of popularity as a wine-grape in the South. The qualities which commended it were: great productiveness; earliness; exceedingly good health and great vigor, as shown by a strong, stocky growth and ample foliage; and almost perfect hardiness even as far north as Canada. Its good qualities are offset by two defects: the grapes have thin skins which burst easily and thus wholly debar them from distant markets; and their flavor and appearance are not sufficiently good to make the variety a table-grape. Elvira originated with Jacob Rommel, Morrison, Missouri, from seed of Taylor.

Vine vigorous, hardy, healthy, productive. Canes numerous, dark brown; nodes flattened; internodes short; tendrils continuous, trifid or bifid. Leaves large, thin; lobes wanting or 1-3 with terminus acute; petiolar sinus deep, narrow, sometimes closed and overlapping; basal sinus usually lacking; lateral sinus shallow, often notched; teeth deep, wide. Flowers self-fertile, open early; stamens upright. Fruit midseason, does not keep well. Clusters short, cylindrical, usually single-shouldered, compact; pedicel smooth; brush short, greenish-yellow with brown tinge. Berries medium in size, round, green with yellow tinge, dull with thin bloom, firm; skin very thin, foxy, sweet; fair in quality. Seeds free, 1-4, medium to large, blunt, plump, dark brown.

EMPEROR. *V. vinifera.* Emperor is one of the standard shipping grapes of the Pacific slope, and one of the mainstays of the interior valleys. On the coast and in southern California, the vine is irregular in bearing, and on the coast the fruits often fail to ripen. It is chiefly grown in the San Joaquin Valley. It could hardly be expected to ripen even in the most favored grape regions in the East. The following brief description is compiled:

Vine strong, healthy and productive. Leaves very large, with 5 shallow lobes; teeth short and obtuse; light green in color, glabrous above, woolly beneath. Bunches very large, loose, sometimes inclined to be straggling, long-conical. Berries large, dull purple, oval; flesh firm and crisp; skin thick; flavor and quality good. Ripens late and keeps and ships well.

EMPIRE STATE. Fig. 224. *V. vulpina* × ? Empire State competes with Niagara and Diamond for supremacy among green grapes. The variety is as vigorous in growth, as free from parasites, and on vines of the same age as productive as those of the other varieties named, but the vines are less hardy, and the grapes are not so attractive in appearance. In particular, the clusters are small in some localities, a defect which can be overcome only by severe pruning or by thinning. The fruits are very good, approaching in flavor the Old World grapes; the slight wild taste suggests one of the Muscats. The grapes ripen early, hang long on the vine, and keep well after picking without losing flavor. Empire State originated with James H. Ricketts, Newburgh, New York, and bore fruit first in 1879.

224. Empire State. (×⅓)

Vine vigorous, somewhat tender. Canes short, few, slender, brownish; nodes enlarged; internodes short; tendrils intermittent, bifid. Leaves small; lobes 3-5 when present, terminal one acuminate; petiolar sinus deep, narrow, often closed and overlapping; basal sinus variable in depth and width; lateral sinus deep, narrow, often enlarged at base; teeth deep, wide. Flowers self-sterile, open late; stamens upright. Fruit midseason, keeps well. Clusters large, long, slender, cylindrical, frequently single-shouldered, compact; pedicel slender with small warts; brush short, light green. Berries medium or small, round, pale yellowish-green, covered with thin bloom, persistent, firm; skin thick, adherent to the pulp, slightly astringent; flesh pale yellowish-green, translucent, juicy, fine-grained, tender, agreeably flavored; good to very good. Seeds adherent, 1-4 small, broad, notched, short, blunt, plump, brown.

ETTA. *V. vulpina* × *V. Labrusca.* In appearance, taste, and texture of fruit, Etta is very similar to Elvira, of which it is a seedling. The small, yellow clusters which characterize Elvira are reproduced in Etta; the fruits differ chiefly in having a better flavor, lacking the slight foxiness of Elvira. The vine is very vigorous, hardy, and productive to a fault. The fruit ripens with that of Catawba. The tendency of Elvira to crack and overbear influenced the originator of that variety, Jacob Rommel, Morristown, Missouri, to try for a grape without these faults, and the result was Etta from seed of Elvira. The fruit was first exhibited in 1879.

Vine vigorous, hardy, productive. Canes long, numerous, light to dark brown; tendrils continuous, bifid. Leaves large, thick. Flowers self-sterile, early; stamens upright. Fruit late, keeps well. Clusters small, short, broad, irregularly cylindrical, usually with a short, single shoulder but sometimes so heavily shouldered as to form a double bunch, very compact. Berries small, round, pale green, dull with thin bloom, shattering when over-ripe, firm; skin thin, tender; flesh juicy, fine-grained, tough, stringy, slightly foxy, mild; fair in quality. Seeds free, long, blunt, brown.

EUMELAN. *V. Labrusca* × *Washington.* The good qualities of Eumelan are: vines above the average in vigor, hardiness, and productiveness; clusters and berries well formed, of good size, and handsome color; flesh tender, dissolving into wine-like juice under slight pressure; and pure flavor—rich, sweet, vinous. The season is early, yet the fruit keeps much better than that of most other grapes maturing with it, and the variety becomes, therefore, a midseason and late grape. The defects of the variety are susceptiblity to mildew, self-sterile flowers, and difficulty in propagation. Eumelan may be recommended to amateur growers. It is a chance seedling which grew about 1847, in the yard of a Mr. Thorne, Fishkill Landing, New York.

Vine vigorous, hardy, productive. Canes numerous, covered with bloom; nodes enlarged; internodes short; tendrils intermittent, long, trifid or bifid. Leaves large; lobes usually 3 with terminal one acute; petiolar sinus deep, variable in width; basal sinus usually lacking; lateral sinus shallow, narrow; teeth shallow. Flowers self-sterile, open in midseason; stamens reflexed. Fruit early, keeps until late winter. Clusters long, slender, tapering, often with a long, loose, single shoulder; pedicel short, slender with a few small warts; brush short, stubby, pale green. Berries of medium size, round, black, glossy with thin bloom, persistent, firm; skin tough, adherent, with wine-colored pigment, astringent; flesh dark green, juicy, fine-grained, tender, stringy, spicy and aromatic, sweet; good. Seeds adherent, 1-4, large, wide, blunt, plump, brown.

EXTRA. *V. æstivalis Lincecumii* × ? *Big Extra.* This variety is a seedling of Post-oak crossed by Triumph, introduced by Munson about 1890. It is of value only in the Southwest, since the fruits will not mature in northern grape regions. It is described as follows in the catalog of T. V. Munson & Son, Denison, Texas.

"Growth strong; clusters oblong to cylindrical, sometimes shouldered; moderately compact. Berries persistent, globular, medium to large, dark purple to black, with moderate bloom; skin thin, tough, never cracks; pulp tender, juicy, sprightly, agreeable, sweet."

FEHER SZAGOS. *V. vinifera.* This variety succeeds rather well at Geneva, New York, and bears fruits of excellent quality. The fruits have two defects, dull color of the berries and irregular bunches. The variety is worth trying in the East. Feher Szagos is said to make a very good raisin in California, and usually appears in lists of table-grapes for that state.

Vines vigorous, somewhat uncertain bearers. Opening leaves pubescent, red along the edges and a tinge of red on the upper surface. Flowers have upright stamens. Fruit usually ripens the first week in October and does not keep well in storage. Clusters large to medium, broad, loose, frequently irregular because of poor setting of fruit; berries large, oval to elliptical, rather dull green, with thin bloom; skin thick, tender, neutral; flesh greenish, translucent, juicy, meaty, tender, sweet; quality of the best. Seeds free.

FERN MUNSON. *V. æstivalis Lincecumii × Admirable. Fern. Hilgarde.* Fern Munson is a southern grape not adapted to northern regions, 40 degrees north latitude being its limit of adaptation. The fruits show some very good characters, as attractive appearance, agreeable quality, and unobjectionable seeds and skin. The vines are vigorous and productive, but the foliage is not healthy, although very abundant. This variety originated with T. V. Munson, Denison, Texas, from seed planted in 1885.

Vine vigorous, doubtfully hardy. Canes long, numerous, thick, dark brown with a faint red tinge; tendrils intermittent, bifid. Leaves large, thick. Flowers semi-fertile, open very late; stamens upright. Fruit late, keeps well. Clusters large, irregularly tapering, usually single-shouldered, often with many abortive fruits. Berries large, round, slightly flattened, dark purplish-black, glossy, covered with thin bloom, strongly persistent, firm; skin thin, tough, astringent; flesh juicy, tough, firm, fine-grained, vinous, briskly subacid; good. Seeds adherent, broad.

FLAME TOKAY. *V. vinifera.* This is the leading shipping grape of the Pacific slope, where it is everywhere grown under the name "Tokay," with several modifying terms, as "Flame", "Flame-colored", and "Flaming". The fruit is not especially high in quality nor attractive in appearance, but it ships and keeps well, qualities making the variety popular in commercial vineyards. The description is compiled.

Vine very vigorous, luxuriant in growth of canes, shoots and leaves dark green with a brown tinge; lightly lobed. Bunches very large, sometimes weighing 8 or 9 pounds, moderately compact; shouldered. Berries large, oblong, red when mature, covered with lilac bloom; flesh firm, crisp, sweet; quality good. Season late, keeps and ships well.

FLOWERS. *V. rotundifolia.* Flowers is noted for its vigorous and productive vines, its large fruit-clusters, and dark-colored grapes that cling in the cluster unusually well for a variety of this species. The crop is late, ripening in North Carolina in October and November. The fruit is valuable only for wine and grape-juice, and has little to recommend it for dessert purposes. Flowers was found in a swamp near Lamberton, North Carolina, more than a hundred years ago, by William Flowers. Improved Flowers, probably a seedling of Flowers, was found near Whiteville, North Carolina, about 1869. It differs from its supposed parent in having a more vigorous and productive vine and larger clusters, the berries of which cling even more tenaciously.

Vine vigorous, healthy, upright, open, very productive. Canes long, slender, numerous. Leaves variable but average medium in size, longer than broad, pointed, cordate, thick, dark green, smooth, leathery; margins sharply serrate; flowers perfect. Fruit very late, keeps well. Clusters large, consisting of 10-25 berries. Berries large, round-oblong, purple or purplish-black, clinging well to the cluster-stem; skin thick, tough, faintly marked with dots; pulp white, lacking in juice, hard, sweetish, austere in flavor; poor for a table-grape but excellent for grape-juice.

GAERTNER. *V. vinifera × V. Labrusca.* The berries and clusters of Gaertner are large and handsomely colored, making a very showy fruit. The plant is vigorous, productive, and as hardy as any of the hybrids between Labrusca and Vinifera. In view of these qualities, Gaertner has not received the attention it deserves, probably because it is more capricious as to soils than some others of its related hybrids. As a market grape, the fruits have the faults of ripening unevenly and of shipping poorly, but they keep well, and this quality, with the desirable ones noted, make Gaertner excellent for the home vineyard. Gaertner is often compared with Massasoit; the two varieties are similar in fruit-characters, but the fruits of Gaertner are of distinctly better quality. The variety originated with E. S. Rogers, Salem, Massachusetts. It was first mentioned about 1865.

Vine vigorous, hardy except in severe winters, productive. Canes long, dark reddish-brown, surface covered with thin bloom; tendrils continuous, bifid or trifid. Leaves medium in size, round. Flowers self-sterile, open late; stamens reflexed. Fruit midseason, matures unevenly, keeps only fairly well. Clusters medium in size, short, cylindrical, usually with a single shoulder but sometimes double-shouldered, loose with many abortive fruits. Berries large, round-oval, light to dark red, glossy, covered with bloom, persistent; skin thin, tender; flesh pale green, juicy, fine-grained, tough, stringy, agreeably vinous; good to very good. Seeds free, large, broad, distinctly notched, brown.

GOETHE. *V. vinifera × V. Labrusca.* Of all Rogers' hybrids, Goethe shows Vinifera characters most; the fruits resemble in appearance those of the White Malaga of Europe, and do not fall far short of the best Old World grapes in quality. But the variety is difficult to grow, especially where the seasons are not long enough for full maturity. The vine is vigorous to a fault; it is fairly immune to mildew, rot, and other diseases; and, where it succeeds, bears so freely that thinning becomes a necessity. In addition to high quality, which makes the fruits excellent table-grapes, they keep well. Goethe was first mentioned in 1858.

Vine vigorous, hardy. Canes short, dark brown; nodes enlarged, flattened; internodes short; tendrils continuous or intermittent, long, bifid to trifid. Leaves irregularly round, thin; leaf usually not lobed, terminus broadly acute; petiolar sinus narrow, closed and overlapping; basal sinus usually lacking; lateral sinus shallow, often a notch; teeth shallow, narrow. Flowers partly self-fertile, open in midseason; stamens upright. Fruit late, keeps well. Clusters short, broad, tapering, frequently single-shouldered, usually 2 bunches to shoot; pedicel long, thick with numerous conspicuous warts; brush long, slender, yellowish-brown. Berries very large, oval, pale red covered with thin bloom, persistent; skin thin, tender, adherent, faintly astringent; flesh pale green, translucent, tender, with Vinifera flavor; very good. Seeds adherent, 1-3, large, long, notched, blunt, brown.

GOLD COIN. *V. æstivalis × V. Labrusca.* In the South, where alone it thrives, Gold Coin produces a handsome market-grape of very good quality. The vines are productive and are unusually free from attacks of fungal diseases. The variety originated with T. V. Munson, Denison, Texas, and was introduced in 1894.

Vine vigorous, hardy, productive. Canes slender, numerous; tendrils continuous, sometimes intermittent, trifid or bifid. Leaves medium in size. Flowers self-

fertile; stamens upright. Fruit late midseason, keeps long. Clusters medium to small, usually single-shouldered. Berries large, round-oval, yellowish-green with a distinct trace of reddish-amber, with thin bloom, usually persistent; skin covered with small, scattering brown dots, thin, tough; flesh faintly aromatic, tart from skin to center; good. Seeds free, numerous, medium in size.

GREIN GOLDEN. *V. vulpina* × *V. Labrusca.* Grein Golden is very similar to Riesling, but the vine is much stronger in growth. Both cluster and berry are large and uniform, qualities which, with the attractive color of the berries, make it a most handsome fruit. The flavor, however, is not at all pleasing, being an unusual commingling of sweetness and acidity very disagreeable to most palates. The quality of the fruit condemns it for table use, although it is said to make a very good white wine. Nicholas Grein, Hermann, Missouri, first grew Grein Golden about 1875.

Vine vigorous, hardy, productive. Canes long, numerous, slender, dark reddish-brown; nodes enlarged, flattened; internodes long; tendrils intermittent, trifid or bifid. Leaves large, thick; lightly pubescent; lobes lacking or 1-3 with terminus acute; petiolar sinus deep, narrow; basal sinus usually lacking; lateral sinus shallow, wide, obscure; teeth deep. Flowers self-sterile, open in midseason; stamens reflexed. Fruit midseason. Clusters large, long, broad, tapering, irregular, often heavily single-shouldered, loose; pedicel with a few inconspicuous warts; brush slender, pale green. Berries uniform in size, large, round, golden yellow, glossy with thin bloom, persistent; skin very thin, tender; flesh green, translucent, very juicy, tender, vinous; good. Seeds free, 1-4, broad, plump, light brown.

GROS COLMAN. *V. vinifera. Dodrelabi.* Gros Colman has the reputation of producing the handsomest black table-grape grown. It is one of the favorite hot-house varieties in England and eastern America, and is commonly grown out-of-doors in California. The variety is remarkable for large berries, borne in immense bunches, and for the long-keeping qualities of the fruits, although the tender skins sometimes crack. The following description is compiled:

Vine vigorous, healthy and productive; wood dark brown. Leaves very large, round, thick, but slightly lobed; teeth short and blunt; glabrous above, woolly below. Bunches very large, short, well filled but rather loose; berries very large, round, dark blue; skin thick but tender; flesh firm, crisp, sweet and good; quality not of the highest. Season late and the fruits keep long.

HARTFORD. *V. Labrusca.* The vine of Hartford may be well characterized by its good qualities, but the fruit is best described by its faults, because of which the variety is passing out of cultivation. The plants are vigorous, prolific, and healthy; and the fruit is borne early in the season. The canes are remarkable for their stoutness and for the crooks at the joints. The bunches are not unattractive, but the quality of the fruit is low, the flesh being pulpy and the flavor insipid and foxy. The berries shell badly on the vine and when packed for shipping, so that the fruit does not ship, pack, or keep well. The grapes color long before ripe, and the flowers are only partly self-fertile, so that the clusters are loose and straggling. The original vine of Hartford was a chance seedling in the garden of Paphro Steele, West Hartford, Connecticut. It fruited first in 1849.

Vines vigorous, very productive. Canes long, dark brown, covered with pubescence; nodes enlarged, flattened; internodes short; tendrils continuous, long, bifid. Leaves large, thick; lobes variable; petiolar sinus deep, narrow; teeth shallow. Flowers partly self-fertile, open in midseason; stamens upright. Fruit early. Clusters medium in size, long, slender, tapering, irregular, often with a long, large, single shoulder, loose; pedicel short with a few small warts; brush greenish. Berries medium in size, round-oval, black, covered with bloom, drop badly; skin thick, tough, adherent, contains much purplish-red pigment, astringent; flesh green, translucent, juicy, firm, stringy, foxy; poor in quality. Seeds free, 1-4, broad, dark brown.

HAYES. *V. Labrusca* × *V. vinifera.* In 1880 the Massachusetts Horticultural Society awarded a certificate of merit to Hayes for high quality in fruit. This brought the variety prominently before grape-growers, and for a time it was popular, but when better known several defects became apparent. The vine is hardy and vigorous, but the growth is slow, and it is a shy bearer. Both bunches and berries are small, and the crop ripens at a time, a week or ten days earlier than Concord, when there are many other good green grapes. Excellent though the fruits are in quality, the variety is hardly worth a place in any vineyard. John B. Moore, Concord, Massachusetts, is the originator of Hayes. It was first fruited in 1872.

Vine variable in vigor and productiveness, hardy and healthy. Canes numerous, slender; nodes enlarged, flattened; internodes short; tendrils intermittent, bifid or trifid. Leaves uniform in size; lobes 1-3; teeth shallow, small. Flowers almost self-sterile, open medium late; stamens upright. Fruit early, keeps well. Clusters variable in size and length, often single-shouldered; pedicel long, slender; brush small, pale green. Berries medium in size, round, greenish-yellow, covered with thin bloom, persistent; skin thin, tender with a few small reddish-brown dots; flesh fine-grained, tender, vinous, sweet at the skin, agreeably tart at center, mild; good. Seeds few, of average size, short, plump, brown.

HEADLIGHT. *V. Labrusca* × ? Headlight is more desirable for southern than for northern vineyards, yet it is worthy of trial in the North. Its meritorious characters are: productiveness, outyielding Delaware, with which it competes; disease-resistant foliage and vines; more than average vigor of vine; high quality, the grapes almost equaling those of Delaware in flavor, and having tender, melting pulp which readily parts from the seeds; and earliness, the crop ripening before that of Delaware and hanging on the vines or keeping after being picked for some time without deterioration. The originator of Headlight, T. V. Munson, states that the seed was planted in 1895.

Vine vigorous, hardy, very productive. Canes short, few in number, slender, reddish-brown; nodes enlarged; internodes short; tendrils continuous, short, bifid, very persistent. Leaves small, thick; lobes 1-3 with terminus obtuse; petiolar sinus intermediate in depth and width; basal sinus usually lacking; lateral sinus shallow, narrow; teeth shallow. Flowers self-sterile, open in midseason; stamens reflexed. Fruit early, keeps well. Clusters small, short, tapering, frequently single-shouldered, compact; pedicel short, slender, covered

with a few small warts; brush yellowish-brown. Berries small, round, dark red with thin bloom, persistent, firm; skin tough, adherent, astringent; flesh green, translucent, very juicy, tender, fine-grained, vinous, sweet; very good. Seeds free, 1-3, small, light brown.

HERBEMONT. *V. æstivalis Bourquiniana. Dunn. Hunt. McKee. Neal. Warren. Warrenton.* In the South, Herbemont holds the rank held by Concord in the North. The vine is fastidious, requiring a well-drained warm soil, and one which is abundantly supplied with humus. Despite these limitations, this variety is grown in an immense territory, extending from Virginia and Tennessee to the Gulf and westward through Texas. The vine is remarkably vigorous, being hardly surpassed in this character by any of our native grapes. The fruits are attractive because of the large bunch and the glossy black of the small berries, and are borne abundantly and with certainty in suitable localities. The flesh characters of the fruit are good for a small grape, neither flesh, skin, nor seeds being objectionable in eating; the pulp is tender, juicy, rich, sweet, and highly flavored. The ample, lustrous green foliage makes this variety one of the attractive ornamental plants of the South. Herbemont was in cultivation in Georgia before the Revolutionary War. In the early part of the last century, it came to the hands of Nicholas Herbemont, Columbia, South Carolina, whose name it eventually took.

Vine very vigorous. Canes long, strong, bright green, with more or less purple and heavy bloom; internodes short; tendrils intermittent, bifid or trifid. Leaves large, round, entire or 3-7-lobed, nearly glabrous above and below. Flowers self-fertile. Fruit very late. Clusters large, long, tapering, prominently shouldered, compact; pedicels short with a few large warts; brush pink. Berries round, small, uniform, reddish-black or brown with abundant bloom; skin thin, tough; flesh tender, juicy; juice colorless or slightly pink, sweet, sprightly. Seeds 2-4, small, reddish-brown, glossy.

225. Herbert. (×⅛)

HERBERT. Fig. 225. *V. Labrusca × V. vinifera.* In all that constitutes a fine table-grape, the fruits of Herbert are as near perfection as those of any other American variety. For a Vinifera-Labrusca hybrid, the vine is vigorous, hardy, and fruitful, ranking in these respects above that of many pure-bred Labruscas. While the fruit ripens with that of Concord, it keeps much later and packs and ships better. The variety is self-sterile and must be set near other varieties. Herbert is deserving attention from commercial growers who supply a discriminating market, and its many good qualities give it high place as a garden grape. The variety is one of Rogers' hybrids, named Herbert in 1869.

Vine very vigorous, productive. Canes long, numerous, thick, dark brown; nodes enlarged, flattened; internodes long; tendrils intermittent, long, bifid or trifid. Leaves large, round; leaf entire, terminus obtuse; petiolar sinus deep, narrow, closed, overlapping; basal and lateral sinuses lacking; teeth shallow. Flowers self-sterile, open in midseason; stamens reflexed. Fruit midseason, keeps well. Clusters large, broad, tapering, 2-3 clusters per shoot, heavily single-shouldered, loose; pedicel thick with small russet warts; brush yellowish-green. Berries large, round-oval, flattened, dull black, covered with thick bloom, persistent, firm; skin thick, tough, adherent, astringent; flesh light green, translucent, juicy, tender, fine-grained; very good. Seeds adherent, 3-6, large, broad, notched, long with swollen neck, blunt, brown with yellow tips.

HERCULES. *V. Labrusca × V. vinifera.* Hercules is characterized by very large berries, which are handsomely colored, and large, well-formed clusters. The flavor, while not of the best, is good. In addition to the desirable qualities of the fruit, the vines are hardy, vigorous, and productive. These good characters, however, cannot make up for the several defects of the variety. The grapes drop and crack badly, and the pulp is tough and adheres too firmly to the seed for a dessert grape, so that the variety is worthless except for breeding purposes. Hercules was introduced by G. A. Ensenberger, Bloomington, Illinois, about 1890.

Vine very vigorous, hardy, very productive. Canes long, dark reddish-brown; nodes enlarged, flattened; internodes long; tendrils continuous, bifid. Leaves large; lobes 1-3, terminus acute; petiolar sinus deep, narrow; basal sinus usually absent; lateral sinus shallow; teeth shallow. Flowers self-sterile, open in midseason; stamens reflexed. Fruit midseason, keeps well. Clusters very large, broad, tapering, 1-3 clusters per shoot, compact; brush pale green. Berries very large, round, black, glossy with heavy bloom, firm; skin adherent, astringent; flesh green, translucent, juicy, very tough, coarse, stringy, foxy; fair in quality. Seeds adherent, 1-5, large, broad, deeply notched, blunt, brown.

HICKS. *V. Labrusca.* Hicks is a remarkably good grape, and, but for the fact that the fruit is almost identical with that of Concord, ripening with it or a little earlier, the variety would have a place in the viticulture of the country. However, since it was introduced some years ago and has not found great favor with growers, it seems that Hicks cannot make headway against Concord, with which it must compete. In many localities the vines are more prolific than those of Concord and of stronger growth. Hicks was introduced in 1898 by Henry Wallis, Wellston, Missouri.

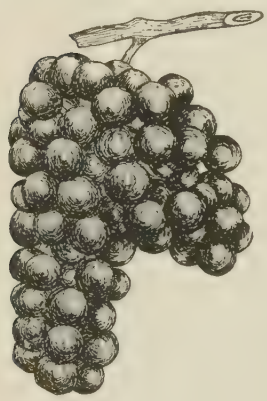
Vine very vigorous, hardy, very productive. Canes medium to long, numerous, reddish-brown, covered with thin bloom; tendrils continuous, bifid or trifid. Leaves large, thick. Flowers self-fertile, open early; stamens upright. Fruit midseason, keeps well. Clusters large, long, broad, tapering, often single-shouldered. Berries large, round, purplish-black with heavy bloom, shatter when over-ripe, firm; skin tender with dark wine-colored pigment; flesh green, juicy, tough, fine-grained, faintly foxy; good. Seeds adherent, large, short, broad, blunt, brown.

HOPKINS. *V. rotundifolia.* Hopkins is named by grape-growers in the South Atlantic

states as one of the good early Rotundifolia grapes. Its season in North Carolina begins early in August, nearly a month before that of any other. Its fruits are among the best in quality, and for quality and earliness the variety should be planted in home vineyards in the region in which it grows. Hopkins was found near Wilmington, North Carolina, about 1845, by John Hopkins.

Vine very vigorous, hardy, productive. Canes long, slender, upright. Leaves of medium size, variable, cordate, longer than broad, thick, leathery, smooth, dark green; margin sharply serrate. Flowers self-fertile. Fruit very early. Clusters large, containing from 4-10 berries. Berries large, dark purple or almost black, round-oblong, shelling badly; skin thick, tough, faintly marked with dots; pulp white, tender, juicy with a sweet, pleasant flavor.

IONA. Fig. 226. *V. Labrusca* × *V. vinifera.* In flavor, the fruit of Iona has a rare combination of sweetness and acidity—pure, delicate, and vinous. The flesh is transparent, melting, tender, juicy, and of uniform consistency quite to the center. The seeds are few and small and part readily from the flesh. The color is a peculiar dark-red wine with a tint of amethyst. The bunch is large but loose, with berries varying in size and ripening unevenly. The fruit may be kept until late winter. The vine-characters of Iona are not so good as those of the fruit. To do well, the vine must have a soil exactly suited to its wants, and seems to thrive best in deep, dry, sandy, or gravelly clays. Iona responds especially well when trained against walls or buildings, the fruits attaining rare perfection under such conditions. The vines are doubtfully hardy, and in many parts of the North must have winter protection; they are not vigorous and are inclined to overbear, to remedy which they must have close pruning. In localities in which mildew and rot thrive, the variety is badly attacked by these diseases. Iona originated with C. W. Grant, Iona Island, New York, from seed planted in 1885.



226. Iona. (×⅓)

Vine weak, doubtfully hardy, unproductive. Canes short, light brown; nodes enlarged; internodes short; tendrils intermittent, bifid. Leaves thick; lobes 3-5 with terminal one acute; petiolar sinus of medium depth and width; basal sinus shallow; lateral sinus shallow, wide; teeth shallow. Flowers self-fertile, open late; stamens upright. Fruit late, keeps well. Clusters medium in size, sometimes double-shouldered, slender, tapering, loose; brush pale green. Berries uniform, oval, round, dull, light and dark red with thin bloom, persistent, firm; skin tough, adherent, slightly astringent; flesh green, translucent, juicy, fine-grained, tender, melting, vinous; very good. Seeds free, 1-4, small, broad, plump, brown.

ISABELLA. *V. Labrusca* × *V. vinifera. Alexander. Black Cape. Constantia. Dorchester. Woodward.* Isabella is of historical interest, since it was one of the mainstays of early American viticulture. In appearance, the fruit of Isabella is fully as attractive as any black grape, the clusters being large and well formed and the berries glossy black with thick bloom. The flavor is good, but the skin and the muskiness in taste are objectionable. The grapes keep and ship well. Isabella is surpassed in vine-characters by many other kinds, notably Concord, which has taken its place. The lustrous green, ample foliage, which remains late in the season, and the vigor of the vine, make this variety an attractive ornamental, well adapted for growing on arbors, porches, and trellises. The origin of Isabella is not known. It was obtained by William Prince, Flushing, Long Island, about 1816, from Mrs. Isabella Gibbs, Brooklyn, New York.

Vine vigorous, hardy, productive. Canes short, numerous, with heavy pubescence, thick, light brown; nodes enlarged, flattened; internodes short; tendrils continuous, long, bifid or trifid. Leaves thick; lobes 3 when present with terminal lobe obtuse; petiolar sinus shallow, narrow, often closed, overlapping; basal sinus usually wanting; lateral sinus shallow, narrow, frequently notched; teeth shallow, wide. Flowers self-fertile, open in midseason; stamens upright. Fruit late, keeps and ships well. Clusters large, cylindrical, frequently single-shouldered; pedicel slender, smooth; brush long, yellowish-green. Berries medium to large, oval, black with heavy bloom, persistent, soft; skin thick, tough, adherent, astringent; flesh pale green, translucent, juicy, fine-grained, tender, meaty, some foxiness, sweet; good. Seeds 1-3, large, broad, distinctly notched, short, brown with yellow tips.

ISABELLA SEEDLING. *V. Labrusca* × *V. vinifera.* Isabella Seedling is an early, vigorous, productive offspring of Isabella. In fruit-characters it greatly resembles its parent, but it ripens its crop earlier and has a more compact bunch. Like that of its parent, the fruit is of good quality and keeps remarkably well. This seedling is now grown more than Isabella, and is far more deserving attention as a market-grape than some of the poorly flavored kinds more generally grown. There are several varieties under this name. Two are mentioned by Warder; one of Ohio and one of New York origin. The Isabella Seedling here described originated with G. A. Ensenberger, Bloomington, Illinois, in 1889.

Vine vigorous, healthy, hardy, productive. Canes long, thick, dark brown, often with a red tinge, with thin bloom; nodes prominent, flattened; internodes long; tendrils intermittent or continuous, bifid. Leaves healthy, large, thick. Flowers self-fertile; stamens upright. Fruit early, keeps well. Clusters large, long, slender, cylindrical, usually single-shouldered, loose, compact. Berries large, oval, often pear-shaped, dull black with thick bloom, persistent, soft; skin thick with some red pigment; flesh pale green, juicy, tender, coarse, vinous; good. Seeds numerous, free, large, broad, notched, dark brown.

IVES. *V. Labrusca* × *V. æstivalis. Kittredge.* Ives has a high reputation as a grape

for making red wine and grape-juice, being surpassed only by Norton for this purpose. The vine is hardy, healthy, vigorous, and fruitful. The fruit is poor in quality, colors long before ripe, has a foxy odor, and the flesh is tough and pulpy. The bunches are compact, with well-formed, jet-black grapes, which make them attractive. The vine is easily propagated, and is adapted to any good grape soil, but is so rampant in growth that it is difficult to manage. The variety is not widely cultivated. Ives was grown by Henry Ives from seed planted in 1840 in Cincinnati, Ohio.

Vine vigorous, hardy, healthy, productive. Canes long, thick, reddish-brown with thin bloom; nodes enlarged, flattened; internodes short; tendrils continuous, bifid or trifid. Leaves large; lobes 3-5 when present with terminal one acute; petiolar sinus shallow; lateral sinus narrow; teeth shallow. Fruit late midseason, keeps well. Clusters large, tapering, frequently single-shouldered, compact, often with numerous abortive berries; pedicel slender with numerous small warts; brush short, slender, pale with a reddish-brown tinge. Berries oval, jet-black with heavy bloom, very persistent, firm; skin tough, adherent, wine-colored pigment, astringent; flesh pale green, translucent, juicy, fine-grained, tough, foxy; good. Seeds adherent, 1-4, small, often abortive, broad, short, blunt, plump, brown.

JAMES. *V. rotundifolia.* James is probably the best general-purpose variety of its species. The vine is noted for vigor and productiveness, and the fruits are large, well flavored, hang on the vines long after ripening, and keep well after harvesting. James cannot be grown north of Maryland, and thrives only in sandy loam soils with clay subsoil. The variety was found by B. W. M. James, Pitt County, North Carolina.

Vine vigorous, healthy, productive. Canes slender, numerous, long, slightly trailing. Leaves of medium size, thick, smooth, leathery, cordate, as broad as long, with a serrate margin. Flowers open late; stamens reflexed. Fruit ripens late, hangs on the vine for 3 weeks, keeps well. Clusters small, containing from 4 to 12 berries, irregular, loose. Berries large, ¾ to ¼ inch in diameter, round, blue-black, marked with specks; skin thick, tough; pulp juicy; sweet; good in quality.

227. Janesville. (×⅓)

JANESVILLE. Fig. 227. *V. Labrusca* × *V. vulpina.* Endowed with a constitution enabling it to withstand cold to which most other grapes succumb, Janesville has made a place for itself in far northern localities. Moreover, the grapes ripen early, being about the first to color, although they are not ripe until some time after coloring. The vine also is healthy, vigorous, and productive. The fruit, however, is worthless where better sorts can be grown. The clusters and berries are small, the grapes are pulpy, tough, seedy, have a thick skin and a disagreeable acid taste. Janesville was grown by F. W. Loudon, Janesville, Wisconsin, from chance seed planted in 1858.

Vine vigorous, hardy, healthy, productive. Canes spiny, numerous, dark brown; nodes flattened; internodes long; tendrils intermittent or continuous, long, bifid or trifid. Leaves small, thin; leaf usually not lobed with terminus acute; petiolar sinus narrow, often closed and overlapping; basal and lateral sinuses lacking; teeth shallow. Flowers self-fertile, open very early; stamens upright. Fruit early, keeps well. Clusters small, short, cylindrical, usually single-shouldered, compact; pedicel short, slender, covered with small, scattering warts; brush dark wine color. Berries round, dull black with heavy bloom, persistent, firm; skin thick, tough, adherent, with dark wine-colored pigment, astringent; flesh pale reddish-green, translucent, juicy, tough, coarse, vinous, acid; fair in quality. Seeds adherent, 1-6, large, broad, angular, blunt, dark brown.

JEFFERSON. *V. Labrusca* × *V. vinifera.* Jefferson resembles Concord in vigor, productiveness, and healthiness of vine, and Iona in color and quality of fruit. The vine produces its fruit two weeks later than Concord and is not so hardy, faults that debar it from taking high rank as a commercial grape. The bunches of Jefferson are large, well-formed, compact, with berries of uniform size and color. The flesh is firm yet tender, juicy, with a rich, vinous flavor and a delicate aroma which persists even after the berries have dried into raisins. The fruit ships and keeps well, the berries adhering to the cluster, and retains its freshness into late winter. Jefferson is widely distributed and is well known by viticulturists in eastern America. It is not particular as to localities, if the season be long and the climate temperate, and thrives in all soils. The variety originated with J. H. Ricketts, Newburgh, New York; it first fruited in 1874.

Vine vigorous, healthy, doubtfully hardy, productive. Canes short, numerous, light to dark brown; nodes enlarged, round; internodes short; tendrils intermittent, short, bifid or trifid. Leaves healthy; leaf usually not lobed with terminus acute; petiolar sinus narrow, sometimes closed and overlapping; basal sinus usually absent; lateral sinus shallow, often a mere notch; teeth regular, shallow. Flowers self-sterile, open late; stamens upright. Fruit late, keeps and ships well. Clusters large, cylindrical, usually single-shouldered, sometimes double-shouldered, compact; pedicel short, slender with a few inconspicuous warts; brush long, slender, pale yellowish-green. Berries medium in size, oval, light and dark red, glossy with thin bloom, persistent, very firm; skin thick, tough, free, slightly astringent; flesh light green, translucent, juicy, coarse-grained, tender, vinous; good to best. Seeds free, 1-4, broad, short, blunt, plump, brown.

JESSICA. *V. Labrusca* × *V. vinifera.* Jessica is an early, hardy, green grape. The fruit is sweet, rich, sprightly, and almost free from foxiness, but is unattractive and does not keep well. The clusters and berries are small, and the clusters are too loose for a good grape. Jessica may be commended for earliness and hardiness and is, therefore, desirable, if at all, in northern regions. William H. Read, Port Dalhousie, Ontario, grew Jessica from seed planted some time between 1870 and 1880.

Vine medium in vigor, healthy, hardy, productive. Canes long, thick, dark brown with red tinge; nodes enlarged, flattened; internodes short; tendrils continuous or intermittent, bifid or trifid. Leaves small; lobes 3; petiolar sinus narrow; teeth shallow, narrow. Flowers self-fertile, open in midseason; stamens upright. Fruit very early. Clusters small, slender, tapering, usually single-shouldered. Berries small, round, light green, often tinged with yellow, covered with thin bloom,

persistent, soft; skin thin, adherent, faintly astringent; flesh pale green, transparent, juicy, tender, soft, sprightly, sweet; good. Seeds adherent, medium to broad, notched, brown.

JEWEL. *V. æstivalis Bourquiniana* × ? The notable characters of Jewel are earliness and high quality in fruit; also, as compared with Delaware, its parent, the vine is vigorous, healthy, and hardy. In form and size of bunch and berry, Jewel closely resembles Delaware, but the grapes are deep black in color. The flesh characters and flavor of the fruit are much like those of Delaware, the pulp being tender yet firm, and the flavor having the same rich, sprightly, vinous taste. The seeds are few and small. The skin is thin but tough, and the grapes ship well, keep long, do not shell, and though early, hang until frost. Jewel is a most excellent grape, worthy the place among black grapes that Delaware has among red varieties. In particular, it is recommended for earliness and for localities in the North where standard varieties do not ripen. John Burr, Leavenworth, Kansas, grew Jewel from seed planted about 1874.

Vine vigorous, healthy, hardy, productive. Canes slender, light reddish-brown; nodes enlarged, flattened; internodes short; tendrils continuous, bifid. Leaves scant, thick; lobes 3 when present with terminus acute; petiolar sinus narrow; basal sinus usually lacking; lateral sinus shallow, wide; teeth shallow.. Flowers self-sterile, open in midseason; stamens reflexed. Fruit early. Clusters small, slender, cylindrical, single-shouldered, compact; pedicel short, slender; brush short, wine-colored. Berries medium in size, round, dark purplish-black, dull with heavy bloom, persistent, firm; skin thin, tough, adherent, wine-colored pigment; flesh pale green, translucent, juicy, fine-grained, tender, sprightly, vinous, sweet; very good. Seeds adherent, 1-4, frequently one-sided, blunt, light brown.

KENSINGTON. *V. vinifera* × *V. vulpina.* Kensington has several very meritorious fruit- and vine-characters. The vine resembles that of Clinton, its Vulpina parent, in vigor, hardiness, growth, and productiveness, but the fruit has many of the characters of the European parent, Buckland Sweetwater. The grapes are yellowish-green, large, oval, and borne in loose clusters of medium size. In quality the fruit of Kensington is not equal to that of Buckland Sweetwater, but is much better than that of Clinton. The flesh is tender and juicy, with a rich, sweet, vinous flavor. The hardiness of the vine and the high quality of the fruit should make Kensington a favorite green grape in northern gardens. This variety was grown by William Saunders, London, Ontario, between 1870 and 1880.

Vine vigorous, hardy, productive. Canes long, slender, light brown; nodes enlarged, flattened; internodes short; tendrils persistent, intermittent or continuous, long, bifid or trifid. Leaves thin; lobes wanting or 1-3 with terminus obtuse; petiolar sinus narrow; basal sinus shallow when present; lateral sinus shallow, usually a notch; teeth deep and wide. Flowers self-fertile, open early, stamens upright. Fruit midseason. Clusters large, cylindrical, often heavily single-shouldered, loose, frequently with many undeveloped berries; pedicel long and slender with small, inconspicuous warts; brush short, pale green. Berries variable in size, oval, yellowish-green, glossy with thin bloom, persistent, firm; skin thin, tough, adherent, faintly astringent; flesh green, transparent, juicy, tender, vinous, sweet; good. Seeds free, 2-4, wrinkled, large, long, broad, sharp-pointed, yellowish-brown.

KING. *V. Labrusca.* King is similar to Concord, with vine more vigorous and prolific; time of ripening and length of season the same; the clusters one-fourth larger; the grapes more persistent; the pulp more tender; the flavor nearly the same but more sprightly; the seeds fewer in number; the wood harder and of shorter joints; and the pedicels longer. King was found in the Concord vineyard of W. K. Munson, Grand Rapids, Michigan, in 1892. The vine was set for Concord and is supposed to be a sport of that variety.

Vine vigorous, hardy, productive. Canes large, dark reddish-brown; nodes enlarged, slightly flattened; internodes short; tendrils continuous or intermittent, trifid or bifid. Leaves unusually large, thick; lobes 3 when present, terminal one acute; teeth shallow, narrow. Flowers self-fertile, open in midseason; stamens upright. Fruit midseason, keeps well. Clusters large, long, broad, irregularly tapering, usually single-shouldered, compact. Berries large, round, black with thin bloom, persistent, firm; skin thick, tough, adherent, astringent; flesh pale green, very juicy, tough, stringy and with some foxiness; good. Seeds adherent, few, large, short, broad, lightly notched if at all, blunt, plump, light brown.

LADY. *V. Labrusca* × *V. vinifera.* The vine of Lady is much like that of Concord, its parent, although not quite so vigorous nor productive, but ripens its fruit fully two weeks earlier. The fruit is much superior in quality to that of Concord, being richer, sweeter, and less foxy. The grapes hang on the vines well, but deteriorate rapidly after picking. The foliage is dense and of a deep glossy green, neither scalding under a hot sun nor freezing until heavy frosts, and makes it an attractive ornament in the garden. Lady is deservedly popular as a grape for the amateur, and should be planted for nearby markets. It succeeds wherever Concord is grown, and because of its early ripening, is especially adapted to northern latitudes where Concord does not always mature. Although the fruit ripens early, the buds start late, often escaping late spring frosts. When Lady was first heard of, it was in the hands of a Mr. Imlay, Muskingum County, Ohio, about 1874.

Vine vigorous, hardy, medium in productiveness, healthy. Canes short, slender, dark reddish-brown; nodes flattened; internodes short; tendrils intermittent, bifid or trifid. Leaves medium in size; lobes 1-5 with terminal one acuminate; petiolar sinus shallow, wide; lateral sinus variable in depth and width; teeth shallow. Flowers self-fertile, open in midseason; stamens upright. Fruit early, does not keep well. Clusters small, short, slender, cylindrical, sometimes single-shouldered, compact; pedicel thick, smooth; brush slender, long, greenish-white. Berries large, round, light green, often with a tinge of yellow, glossy with thin bloom, persistent, firm; skin covered with small, scattering, dark dots, thin, tender, adherent, astringent; flesh greenish-white, translucent, juicy, tender, aromatic; very good. Seeds free, few, broad, light brown.

LENOIR. *V. æstivalis Bourquiniana. Alabama. Black El Paso. Black July. Black Spanish. Burgundy. Cigar Box Grape. Devereaux. Jacques. Ohio.* Lenoir is a tender southern grape which has been used largely in France and California as a resistant stock and a direct

PLATE XII.—JUNE RED RASPBERRY.

producer. The fruit is highly valued for its dark-red wine, and is very good for table use. The vine is resistant to phylloxera and withstands drouth well. The origin of Lenoir is unknown. It was in cultivation in the early part of the last century. Nicholas Herbemont states in 1829 that its name was given from a man named Lenoir who cultivated it near Statesburg, South Carolina.

Vine vigorous, thrifty, semi-hardy, productive. Canes numerous, with some bloom at the nodes; tendrils intermittent. Leaves with 2-7 lobes, usually 5, with characteristic bluish-green color above and pale green below. Clusters variable, medium to very large, tapering, usually shouldered. Berries small, round, dark bluish-purple, nearly black with lilac bloom; skin thick, tough; flesh juicy, tender, sweet, very rich in coloring matter.

LIGNAN BLANC. *V. vinifera. White July. Luglienga. Joannenc.* At Geneva, New York, Lignan Blanc ripens first of all grapes, native or European. The fruit is not of highest quality, but is better than that of any other early grape. The variety makes a valuable addition to the home vineyard, and should be one of the first Vinifera grapes to be considered for planting in the East. It is a favorite grape in Europe, and is rather commonly grown in California. This variety offers excellent material for hybridization with native grapes. It is an old European sort.

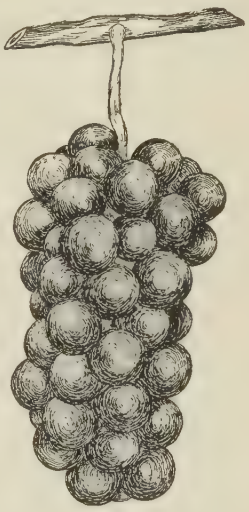
Vine vigorous, medium productive; buds open early; opening leaves light green, glossy, tinged with red along the edges, thinly pubescent. Leaves medium in size, roundish, somewhat dull green, slightly rugose; blade thick; lobes usually 5 though sometimes 3; petiolar sinus medium in depth, wide; lower lateral sinus medium in depth, narrow; upper lateral sinus shallow, narrow; margin dentate; teeth long, narrow. Flowers appear early for a Vinifera; stamens upright. Fruit ripens the first of September and is a good keeper; clusters above medium in size, tapering, medium compact; berries medium to large, oval, yellowish-green, with thin bloom; skin thin, tender, neutral; flesh greenish-white, firm, juicy, meaty, sweet; quality good.

228. Lindley. (×⅓)

LINDLEY. Fig. 228. *V. Labrusca* × *V. vinifera.* By common consent, Lindley is the best of the red grapes originated by Rogers. The bunches are of only medium size and are loose, but the berries are well-formed, of uniform size, and of an attractive dark-red color. The flesh is firm, fine-grained, juicy, tender, with a peculiarly rich aromatic flavor. The skin is thick and tough but is not objectionable in fruit fully ripe. The fruit keeps and ships well, and the berries neither crack nor shatter. The vine is vigorous, hardy for a Vinifera hybrid, healthy, but, like most of its kind, susceptible to mildew. The chief defects of Lindley are self-sterility, precariousness in bearing, and lack of adaptation to many soils. Lindley is a general favorite in the garden. In 1869, Rogers gave this grape its name in honor of John Lindley, the English botanist.

Vine vigorous, usually hardy, susceptible to mildew. Canes very long, dark reddish-brown with thin bloom; nodes enlarged, usually flattened; internodes long, thick; obscurely three-lobed with terminus acute; petiolar sinus deep, narrow, often closed and overlapping; teeth shallow. Flowers self-sterile, open in midseason; stamens reflexed. Fruit midseason, keeps and ships well. Clusters long, broad, cylindrical, frequently single-shouldered, the shoulder being connected to the bunch by a long stem, loose; pedicel short, slender, smooth; brush short, pale green. Berries large, round-oval, dark-red with faint bloom; skin tough, adherent, unpigmented, strongly astringent; flesh pale green, translucent, juicy, fine-grained, tender, vinous; good to best. Seeds adherent, 2-5, notched, brown.

LUCILE. Fig. 229. *V. Labrusca.* In vigor, health, hardiness, and productiveness, Lucile is not surpassed by any native grape. Unfortunately, the fruit-characters are not so desirable. The size, form, and color of bunches and berries are good, making a very attractive fruit, but the grapes have an obnoxious, foxy taste and odor, and are pulpy and seedy. Lucile is earlier than Concord, the crop ripening with that of Worden or preceding it a few days. For an early variety, the fruit keeps well, and, in spite of a thin skin, ships well. The vine thrives in all grape soils. Lucile may be recommended where a hardy grape is desired, and for localities in which the season is short. J. A. Putnam, Fredonia, New York, grew Lucile. The vine fruited first in 1890.



229. Lucile. (×½)

Vine vigorous, hardy, very productive. Canes long, light brown; nodes enlarged, flattened; internodes short; tendrils continuous, bifid or trifid. Leaves large, firm; leaf with terminus acute; petiolar sinus shallow, narrow, sometimes closed and overlapping; basal sinus usually absent; lateral sinus a notch when present; teeth shallow. Flowers self-fertile, open early; stamens upright. Fruit early, keeps well. Clusters large, long, slender, cylindrical, usually single-shouldered, very compact; pedicel short, thick, with few, small, inconspicuous warts; brush light brown. Berries large, round, dark red with thin bloom, persistent, firm; skin thin, tender, astringent; flesh pale green, translucent, juicy, tough, stringy, foxy; fair in quality. Seeds adherent, 1-4, small, broad, short, blunt, dark brown.

LUTIE. *V. Labrusca.* Lutie is chiefly valuable for its vine-characters. The vines are vigorous, hardy, healthy, and fruitful. Pomologists differ widely as to the merits of the fruit: some claim high quality for it, and others declare that it is no better than a wild Labrusca. The difference of opinion is due to a peculiarity of the fruit; if eaten fresh, the quality, while far from being of the best, is not bad, but after being picked for several days, it develops so much foxiness of flavor and aroma that it is scarcely edible. Lutie is a seedling found by L. C. Chisholm, Spring Hill, Tennessee. It was introduced in 1885.

Vine vigorous, hardy, healthy, productive. Canes short, slender, dark reddish-brown; nodes enlarged; internodes short; tendrils continuous, short, bifid. Leaves medium in size; leaf usually not lobed with terminus acute; petiolar sinus deep, wide; basal sinus lacking; lateral sinus shallow and narrow when present; teeth shallow, narrow. Flowers self-fertile, early; stamens upright. Fruit early, does not keep well. Clusters medium in size, short, broad, blunt, cylindrical, usually not shouldered, compact; pedicel short with small, scattering warts; brush slender, pale green. Berries large, round, dark red, dull with thin bloom, drop badly from pedicel, firm; skin tender, adherent, astringent; flesh pale green, translucent, juicy, tough, foxy; fair in quality. Seeds adherent, 1-4, large, broad, short and blunt, dark brown.

McPIKE. *V. Labrusca.* McPike is noteworthy because of the large size of the berries and bunches. The fruits are very similar to those of its parent, Worden, differing in having fewer but larger berries, grapes not so high in flavor, and fewer and smaller seeds. Because of the thin, tender skin, the berries crack badly. The grapes shell more or less, and the vines are less productive than those of Worden. The faults named debar McPike from becoming a commercial grape, and the fruits are not high enough in quality to make it of value for the amateur. This variety originated with H. G. McPike, Alton, Illinois, from seed of Worden planted in 1890.

Vine vigorous, hardy, very productive. Canes of medium length, dull reddish-brown; nodes enlarged, flattened; internodes very short; tendrils continuous, bifid or trifid. Leaves large, thick; leaf entire with terminus acute; petiolar sinus deep; basal and lateral sinuses lacking. Flowers nearly self-fertile. Fruit midseason, keeps well. Clusters variable in size, broad, irregularly tapering, usually not shouldered; pedicel long, thick, smooth; brush long, slender, green with brown tinge. Berries unusually large, round, purplish-black with heavy bloom, firm; skin cracks, adherent to pulp, astringent; flesh pale green, translucent, juicy, tender, stringy, vinous; fair to good. Seeds adherent, 1-4, short, broad, blunt, plump, light brown.

MALAGA. *V. vinifera.* The fruit of Malaga is one of the favorite table-grapes in California, and is also much grown to ship to eastern markets. In some parts of southern California, where the Muscats do not thrive, Malaga is much grown, and in the San Joaquin Valley its fruits are rather largely used in making raisins. It requires a long season to mature its crop and probably could not be grown in eastern regions except in the most favored localities. The description is compiled.

Vine very vigorous, healthy and productive; wood reddish-brown, short-jointed. Leaves of medium size, smooth, leathery; light glossy green above, lighter below; deeply lobed. Bunches very large, long, loose, shouldered, sometimes scraggly; stem long and flexible. Berries very large, oval, yellowish-green, covered with light bloom; skin thick; flesh firm, crisp, sweet and rich; quality good. Season late, keeps and ships well.

MARGUERITE. *V. æstivalis Lincecumii* × ? This variety is another of the Post-oak hybrids from T. V. Munson, Denison, Texas. The other parent is Herbemont, with which the cross was made about 1890. Marguerite is grown only in Texas and neighboring states, as the growing season is too short in northern regions.

Vine very vigorous, very productive; shoots spiny, not downy. Leaves medium to large, 3 to 5 lobes. Flowers semi-sterile; stamens upright. Fruit very late. Clusters medium in size, cylindrical, shouldered, compact. Berries large, round, dark purple; skin thin, tough; flesh tender, rich, sweet, quality good to very good.

MARTHA. *V. Labrusca* × *V. vinifera.* Martha was at one time a popular green grape, but the introduction of superior varieties has reduced its popularity until now it is but little grown. It is a seedling of Concord and resembles its parent, differing chiefly as follows: the fruits are green and a week earlier; bunch and berry are smaller; the flavor is far better, being sweeter, more delicate, and less foxy; the vine is a lighter shade of green and less robust; and the blossoms open a few days earlier than those of Concord. One of the defects of Martha, and the chief cause of its going out of favor, is that the fruit does not keep nor ship well. The variety is still being planted in the South, but is usually abandoned in the North. Samuel Miller, Calmdale, Pennsylvania, grew Martha from seed, and introduced it about 1868.

Vine hardy, productive, susceptible to attacks of mildew. Canes long, dark reddish-brown, surface with thin bloom, roughened; nodes enlarged, slightly flattened; tendrils continuous, or intermittent, bifid. Leaves large, thick; lobes wanting or faint; petiolar sinus shallow, very wide; teeth irregular. Flowers self-fertile, open in midseason; stamens upright. Fruit early midseason. Clusters medium in size, tapering, single-shouldered, loose; pedicel short, slender; brush very short, green. Berries medium in size, round, light green with thin bloom, persistent; skin thin, very tender, adherent; flesh pale green, juicy, tough, fine-grained, slightly foxy; very good. Seeds few in number, adherent, broad, blunt, dark brown.

MASSASOIT. *V. Labrusca* × *V. vinifera.* Massasoit is distinguished as the earliest of Rogers' hybrids, its crop ripening with that of Delaware. The grapes have the peculiarity of being best before full maturity, developing after ripening a degree of foxiness which impairs the quality. In shape and size of berry and bunch, there is a striking resemblance to Isabella, but the color is that of Catawba. The texture of the fruit is especially good, firm but tender and juicy, while the flavor is rich and sweet. The vine is vigorous, hardy, and productive, but subject to mildew and rot. Massasoit is worthy of a place in the home vineyard and as an early grape of fine quality for local markets.

Vine vigorous, hardy, very productive, subject to rot and mildew. Canes long, thick, dark brown with reddish tinge; nodes enlarged, flattened; tendrils continuous, long, trifid or bifid. Leaves variable in size; lobes 3-5 with terminus acute; petiolar sinus deep, narrow; basal sinus shallow, narrow, obscure; teeth shallow. Flowers self-sterile, open late; stamens reflexed. Fruit early, keeps well. Clusters variable in size, broad, cylindrical, frequently single-shouldered; pedicel slender with a few indistinct warts; brush pale green. Berries large, round-oval, dark brownish-red, dull with thin bloom, very persistent, firm; skin thin, tender, adherent, astringent; flesh pale green, translucent, juicy, fine-grained, soft, stringy, foxy; good to very good. Seeds adherent, 1-5, large, broad, distinctly notched, plump, blunt.

MEMORY. *V. rotundifolia.* Memory is one of the best of the Rotundifolia grapes for the garden and local markets, and its fruits are especially good for dessert. As yet, however, the variety has not been widely distributed even in North Carolina, where it originated. The variety is given credit for being the most productive of the grapes of its species. Memory is probably a seedling of Thomas, which it much resembles, and was found by T. S. Memory in a vineyard of Thomas grapes near Whiteville, North Carolina, about 1868.

Vine very vigorous, healthy, productive. Leaves large, longer than broad, thick, smooth with coarsely serrate margins. Flowers perfect. Fruit ripens in September in North Carolina. Clusters large, with from four to twelve berries which hang unusually well for a variety of *V. rotundifolia*. Berries very large, round-oblong, deep brownish-black, almost jet black; skin thick; flesh tender, juicy, sweet; good to best.

MERRIMAC. *V. Labrusca* × *V. vinifera.* Merrimac is often accredited with being the best black grape among Rogers' hybrids, but an analysis of the characters of the several black varieties grown by Rogers shows that it is surpassed by Wilder, Herbert, and possibly Barry. The vine is strong in growth, productive, hardy, and exempt from fungal diseases; but the grapes are not high in quality, and flesh-, skin-, and seed-characters are such that the fruit is not so pleasant to eat as that of the other black varieties named. Merrimac is worthy of a place in collections for the sake of variety. Rogers gave this variety the name Merrimac in 1869.

Vine vigorous, usually hardy, productive. Canes slender, dark brown, surface roughened; nodes enlarged, flattened; internodes short; tendrils intermittent, short, bifid. Leaves large, thin; lobes 3 with terminal one obtuse; petiolar sinus usually lacking; lateral sinus shallow, narrow; teeth shallow. Flowers self-fertile, open in midseason; stamens reflexed. Fruit midseason, keeps and ships well. Clusters variable in size, broad, tapering; pedicel slender, covered with numerous inconspicuous warts; brush wine-colored. Berries large, round, black, glossy with abundant bloom; persistent, firm; skin thick, tough, adherent, astringent; flesh light green, translucent, juicy, fine-grained, tender, stringy; good. Seeds adherent, 1-5, broad, long, with enlarged neck, brown.

MILLS. Fig. 230. *V. Labrusca* × *V. vinifera.* The bunches and berries of Mills are large and well-formed; the berries are firm and solid, with the skin adherent as in the Vinifera; the flesh is juicy and parts readily from the seeds; the flavor is rich, sweet, and vinous; and the grapes are hardly surpassed in keeping quality. But when the fruit-characters of Mills have been praised, nothing further can be said in its favor. The vines are neither vigorous, hardy, nor fruitful, and are very subject to mildew; neither wood nor roots ripen well in the North in average seasons; and the variety is a most difficult one for nurserymen to grow. Mills is of doubtful

230. Mills. (×⅓)

commercial value, but for the garden the grower may graft it to advantage on some variety with better vine-characters. William H. Mills, Hamilton, Ontario, grew Mills about 1870 from seed of Muscat Hamburg fertilized by Creveling.

Vine medium in vigor, hardiness and productiveness. Canes long, light brown, thick; nodes enlarged, flattened; tendrils intermittent, bifid or trifid. Leaves large, thick; lobes 3-5 with terminus acute; petiolar sinus wide; teeth deep. Flowers self-fertile, open in midseason; stamens upright. Fruit midseason, keeps well. Clusters large, long, slender, cylindrical, often double-shouldered, compact; pedicel slender with numerous, small warts; brush long, wine-colored. Berries large, oval, jet-black with abundant bloom, persistent, firm; skin thick, tough, adherent; flesh light green, translucent, juicy, rich, tender, sprightly, vinous, sweet; very good to best. Seeds free, 1-3, large, brown.

MISH. *V. rotundifolia.* Mish is a favorite Rotundifolia in North Carolina, and is planted extensively in some parts of that state. Its outstanding characters are vigor and productiveness in vine, and high quality in the fruit. Mish is named by many as the best all-round Rotundifolia: its fruits are of value for dessert, wine, and grape-juice. The variety was found by W. W. Mish, about 1846, near Washington, North Carolina.

Vine very vigorous, productive, healthy, open in growth; canes somewhat trailing. Leaves large, round, thick, smooth, leathery with coarsely dentate margin. Flowers perfect. Fruit late, does not ripen uniformly, keeps and ships well. Clusters of medium size with from six to fifteen berries which cling well to the pedicel. Berries of medium size, round-oval, deep reddish-black with numerous conspicuous dots; skin thin, cracking in wet weather; flesh tender, juicy, sweet, exceptionally well flavored; very good to best.

MISSION. *V. vinifera.* Of all grapes, Mission has probably played the most important part in the vineyards of California. Grown from the earliest times at the old missions, its source or its name has never been determined. Its viticultural value for table and wine-press was early appreciated by Californian grape-growers, and its culture rapidly spread to every county in the state adapted to grape-growing. With vines vigorous, healthy, and productive, bearing grapes of delicious quality, Mission is a mainstay on the Pacific slope, surpassed by few vineyard varieties for general usefulness. The description is compiled.

Vine vigorous, healthy, productive; wood short-jointed, grayish-brown, dull, dark. Leaf medium to large, slightly oblong, with large, deeply-cut compound teeth; basal widely opened, primary sinuses narrow and shallow; smooth on both sides with scattered tomentum below, bright green above, lighter below. Bunch divided into many small, distinct lateral clusters, shouldered, loose, sometimes very loose. Berries of medium size, purple or almost black with heavy bloom; skin thin; flesh firm, crisp, juicy, sweet, rich and delicious. Seeds rather large and prominent; season late.

MOORE EARLY. Fig. 231. *V. Labrusca.* Moore Early is the standard grape of its season. Its fruits cannot be described better than by saying that they are almost identical with those of Concord. The vines, however, are readily distinguishable from those of Concord, and differ chiefly in being less productive. To grow the variety satisfactorily, the soil must be rich, well-drained, loose, and must be frequently cultivated, and the vines should be pruned severely. The bunches of Moore Early are not so large as those of Concord, and are less compact; the berries shell rather more easily, and the skin cracks more readily. The flesh-characters and the flavor are essentially those of Concord, although the quality is not so high as in the older variety. The fruit is, however, of much higher quality than that of Champion and Hartford, chief competitors of Moore Early, and varieties which it should replace. Moore Early is by no means an ideal grape for its season, but until a better variety is introduced it will probably remain the best early commercial sort. Captain John B. Moore, Concord, Massachusetts, originated this variety from seed of Concord planted about 1868.

231. Moore Early. (×⅓)

Vine vigorous, hardy, unproductive. Canes short, dark reddish-brown; nodes enlarged, flattened; internodes short, tendrils continuous, bifid or trifid. Leaves large, thick; leaf usually not lobed, terminus acute; petiolar sinus wide; basal sinus lacking; lateral sinus a notch when present; teeth shallow, narrow. Flowers fertile, open in midseason; stamens upright. Fruit early, does not keep well. Clusters medium in size, length, and breadth, cylindrical, sometimes single-shouldered, loose; pedicel short, thick, smooth; brush short, pale green. Berries large, round, purplish-black, firm; skin tender, adherent; flesh green, translucent, juicy, fine-grained, tough with slight foxiness; fair to good. Seeds 1-4, large, broad, plump, blunt, brown with yellow tinge at tips.

MOSCATELLO. *V. vinifera. Moscatello Nero. Black Muscat.* Beautiful in appearance and having a delicate Muscat taste and aroma, the fruits of this variety make about the best table-grape for the Pacific slope. Unfortunately, the crop ripens so late that Moscatello is hardly worth trying in the East. The variety has the reputation of being very productive. The description is compiled.

Vine vigorous, healthy, very productive. Leaves of medium size, with deep upper and shallow lower sinuses; glabrous above, slightly downy below, very hairy on the veins, with long, sharp teeth. Bunch large to very large, long, loose, conico-cylindrical, winged. Berries very large, borne on long slender pedicels, dark purple, almost black; skin thin but tough; flesh rather soft, juicy; flavor sweet, rich, aromatic, musky; quality very good. Season late, does not keep well.

MOYER. *V. æstivalis Bourquiniana* × *V. vinifera. Jordan. Moyer's Early Red.* Moyer is almost a counterpart of its parent, Delaware. But for the fact that its crop is from one to two weeks earlier than that of Delaware, and the vines are somewhat hardier, hence better adapted for cold regions, Moyer could have no place in viticulture. Compared with Delaware, the vine is hardly as vigorous and is less productive, but is freer from rot and mildew. The bunches are much like those of Delaware, but have the fault of setting fruit imperfectly even when cross-pollination is assured; the berries are a little larger, of much the same color, and of like flavor—rich, sweet, with pure vinousness, and without a trace of foxiness. The fruit keeps well, ships well, and does not crack nor shell. Moyer is well established in Canada, proving perfectly hardy wherever Concord is grown, and possibly standing even more cold. W. H. Read, Port Dalhousie, Ontario, raised the original vine of Moyer, about 1880.

Vine vigorous, hardy, healthy, unproductive. Canes numerous, slender, dull, dark reddish-brown; nodes enlarged, flattened; internodes short; tendrils continuous, long, bifid or trifid. Leaves small; lobes 2-5 with terminus acute; petiolar sinus shallow; basal sinus shallow when present; lateral sinus shallow, narrow; teeth very shallow, narrow. Flowers self-sterile, open early; stamens reflexed. Fruit early, keeps well but loses color if kept too long. Clusters small, short, slender, tapering, sometimes single-shouldered; pedicel short with small warts; brush yellowish-green. Berries small, oblate, dark red with faint bloom, persistent, firm; skin tough, free, astringent; flesh translucent, juicy, tender, fine-grained, vinous; good to very good. Seeds free, 1-4, broad, short, very blunt, brown with yellow tinge at tips.

MUSCATEL. *V. vinifera. White Frontignan.* This old standard sort is rather commonly grown in some of the grape regions of California to follow Chasselas Golden. It might be tried with some show of success in

favored grape regions in the East. The description is compiled.

Vine of medium size, vigorous, healthy; canes strong, spreading, reddish-brown with short internodes. Leaves of medium size, thin, 5-lobed; glabrous except on the lower sides of the well-marked ribs where a few hairs show. Bunches long, cylindrical, regular, compact. Berries round, golden-yellow becoming amber; flavor sweet, rich, aromatic, peculiar; quality very good. Season late midseason, keeps and ships well.

MUSCAT OF ALEXANDRIA. *V. vinifera.* This is possibly the leading table- and raisin-grape of the Pacific slope. From the literature or from a visit to vineyards, one cannot make out whether one variety or several varieties are grown under the name. Probably there are several strains grown under the distinctive name "Muscat" which is applied to these sweet, light yellow, musky grapes. This is one of the standard sorts to force indoors, but requires too long a season for out-of-doors in the East. The following description is compiled:

Vine short, straggling, bushy, sometimes forming a bush rather than a vine, very productive; wood gray with dark spots, short-jointed. Leaf round, 5-lobed; bright green above, lighter green below. Bunches long and loose, shouldered. Berries oblong, light yellow and transparent when fully mature, covered with white bloom; flesh firm, crisp; flavor sweet and very musky; quality good. Season late, the laterals producing a second, sometimes even a third, crop.

MUSCAT HAMBURG. *V. vinifera.* Muscat Hamburg is an old European grape well known in some parts of America in greenhouse graperies, since it is one of the best for forcing. All who know the beautiful fruits of this variety grown in forcing-houses will want to test Muscat Hamburg out-of-doors. At the Geneva, New York, Experiment Station, it has done well, producing clusters attaining a weight of a pound and a half to two pounds. One is struck with wondering admiration at the vine of this variety laden with grapes growing by the side of plants of Concord, Niagara, or Delaware. The fruits are delectable, containing the quintessence of the flavors and aromas which make the grape a favorite fruit. The grapes keep long and retain almost to the end their form, size, and color, and their rich, delicate flavor. This variety is a treasure to the amateur; and the professional who wants another grape for local markets should try grafting over a few vines of some native to this sort.

Vines vigorous, tender, need protection during the winter; canes long, numerous, slender to medium, light brown, darker at the nodes which are enlarged and flattened. Leaves medium to large. Fruit ripens in October, ships and keeps well. Clusters very large, long, broad, tapering, single- or double-shouldered. Berries large, firm, oval, very dark purplish-red, covered with lilac bloom, very persistent; skin thick, adheres strongly to the pulp; flesh pale green, translucent, meaty, very juicy, tender, vinous, musky, sweet, rich; very good to best. Seeds separating easily from the pulp, large.

NIAGARA. Fig. 232. *V. Labrusca* × *V. vinifera.* Niagara is the leading American green grape, and holds the rank among grapes of this color that Concord maintains among black varieties. It is, however, a less valuable grape than Concord, and it is doubtful whether it should be ranked much higher than several other green grapes. In vigor and productiveness, when the two grapes are on equal footing as to adaptability, Niagara and Concord rank the same. In hardiness of root and vine, Niagara falls short of Concord; it cannot be

232. Niagara. (×⅓)

grown without winter protection where the thermometer falls much below zero. Both bunches and berries of Niagara are larger than those of Concord and are better formed, making a handsomer fruit. The fruit shells as badly as that of Concord and does not keep longer. Both vine and fruit of Niagara are more susceptible to fungal diseases than those of Concord, especially to black-rot, which proves a veritable scourge with this variety in unfavorable seasons. Niagara was produced by C. L. Hoag and B. W. Clark, Lockport, New York, from seed of Concord fertilized by Cassady, planted in 1868.

Vine vigorous, lacking in hardiness, very productive. Canes long, thick, reddish-brown deepening in color at the nodes which are enlarged and slightly flattened; internodes long, thick; tendrils continuous, long, bifid or trifid. Leaves large, thick; lobes 3-5 with terminus acute; petiolar sinus of medium depth and width; basal sinus shallow, wide, often toothed; lateral sinus wide, frequently toothed; teeth shallow, variable in width. Flowers self-fertile, open in midseason; stamens upright. Fruit midseason, keeps well. Clusters large, long, broad, tapering, frequently single-shouldered, compact; pedicel thick with a few, small, inconspicuous warts; brush pale green, long. Berries large, oval, pale yellowish-green with thin bloom, persistent, firm; skin thin, tender, adherent, astringent; flesh light green, translucent, juicy, fine-grained, tender, foxy; good. Seeds free, 1-6, deeply notched, brown.

NOAH. *V. vulpina* × *V. Labrusca.* Noah is little known at present outside of Missouri, where it is still planted somewhat. Noah and Elvira are often confused, but there are marked differences. The clusters of Elvira

are smaller, the berries are more foxy in taste, and the skins are more tender and crack more readily than those of Noah. The large, dark, glossy green leaves make the vines of this variety very handsome. Like Elvira and other varieties of this group, Noah is of little value in the North. It originated with Otto Wasserzieher, Nauvoo, Illinois, from seed of Taylor planted in 1869.

Vine vigorous, doubtfully hardy, productive. Canes long, thick, dark brown, surface roughened; nodes enlarged, flattened; tendrils continuous, bifid or trifid. Leaves large; leaf usually not lobed with terminus acuminate; petiolar sinus deep, wide; basal sinus lacking; lateral sinus shallow when present; teeth shallow, wide. Flowers semi-fertile, open early; stamens upright. Fruit late midseason, does not ship nor keep well. Clusters variable in size, cylindrical, single-shouldered, compact; pedicel short with a few small warts; brush short, brown. Berries small, round, light green tinged with yellow, dull with thin bloom, firm; skin adherent to pulp; flesh yellowish-green, translucent, juicy, tough, fine-grained, vinous, sprightly; good. Seeds adherent, 1-4, dark brown.

NORTHERN MUSCADINE. *V. Labrusca.* The fact that this variety, together with Lucile, Lutie, and other grapes with the foxy taste strongly marked, has not become popular, in spite of good vine-characters, is evidence that the American public do not desire such grapes. In appearance of fruit, Northern Muscadine is much like Lutie, and the two are distinguished from other grapes by an unmistakable odor. A serious defect of the fruit is that the berries shatter badly as soon as they reach maturity. Taken as a whole, the vine characters of this variety are very good and offer possibilities for the grape-breeder. The variety originated at New Lebanon, New York, about 1852.

Vine vigorous, productive, healthy, hardy. Canes slender, dark brown, heavily pubescent; tendrils continuous, bifid, dehisce early. Leaves large, round, thick. Flowers self-fertile, open in midseason; stamens upright. Fruit early midseason, does not keep well. Clusters medium in size, short, occasionally single-shouldered, compact. Berries large, oval, dark amber with thin bloom, drop badly from the pedicels; skin tough, adherent, astringent; flesh pale green, juicy, fine-grained, tender, soft, very foxy, sweet; poor in quality. Seeds free, numerous, large, broad, faintly notched, long, brown.

NORTON. *V. æstivalis* × *V. Labrusca.* Norton is one of the leading wine-grapes in eastern America, but the fruit has small value for any other purpose than wine or grape-juice. The vine is hardy but requires a long, warm season to reach maturity, so that it is seldom grown successfully north of the Potomac. Norton thrives in rich alluvial clays, gravels, or sands; the only requisite seems to be a fair amount of fertility and soil warmth. The vines are robust; very productive, especially on fertile soils; as free, or more so, from fungal diseases as any other of our native grapes; and very resistant to phylloxera. The bunches are of but medium size and the berries are small. The grapes are pleasant eating when ripe—rich, spicy, and pure-flavored—but tart if not quite ripe. The variety is difficult to propagate from cuttings and to transplant, and the vines do not bear grafts well. The origin of Norton is uncertain, but it has been under cultivation since before 1830, when it was first described.

Vine very vigorous, healthy, half-hardy, productive. Canes long, thick, dark brown, with abundant bloom; nodes much enlarged; internodes long; tendrils intermittent, occasionally continuous, long, bifid, sometimes trifid. Leaves large, irregularly round; leaf usually not lobed with terminus acute; petiolar sinus deep, narrow, sometimes closed and overlapping; basal sinus usually absent; lateral sinus shallow or a mere notch when present. Flowers self-fertile, late; stamens upright. Fruit late, keeps well. Clusters medium in size, short, broad, tapering, single-shouldered, compact; pedicel slender with a few warts; brush dull, wine-colored. Berries small, round-oblate, black, glossy with heavy bloom, persistent, soft; skin thin, free with much dark red pigment; flesh green, translucent, juicy, tender, spicy, tart. Seeds free, 2-6, small, brown.

OZARK. *V. æstivalis* × *V. Labrusca.* Ozark belongs to the South and to Missouri in particular. Its merits and demerits have been threshed out by the Missouri grape-growers with the result that its culture is somewhat increasing. The grapes are of low quality, partly, perhaps, from overbearing, which the variety habitually does unless the fruit is thinned. The vine is healthy and a very strong grower, but is self-sterile,—a quality which is against it as a market sort. In spite of self-sterility and low quality, Ozark is a promising variety for the country south of Pennsylvania. Ozark originated with J. Stayman, Leavenworth, Kansas, about 1890.

Vine very vigorous, hardy, productive. Canes long, thick, with thin bloom, surface roughened; nodes enlarged, flattened; internodes long; tendrils intermittent, usually bifid. Leaves dense, large; cobwebby; lobes 3-5; petiolar sinus deep, narrow; serrations shallow, narrow. Flowers self-sterile or nearly so, open late; stamens reflexed. Fruit late, keeps well. Clusters large, long, usually with a long, loose shoulder, very compact; pedicel short, thick, smooth; brush long, red. Berries variable in size, dull black with abundant bloom, persistent; skin tough with much wine-colored pigment; flesh tender, mild; fair in quality. Seeds free, small.

PALOMINO. *V. vinifera. Golden Chasselas. Listan.* This variety seems to be grown in California under the three names given, while in France, Palomino is described as a bluish-black grape. Palomino seems to be grown commonly in California as a table-grape, and is worth trying in eastern America. The variety as received from California at the New York Experiment Station has the following characters, agreeing with those set down by Californian viticulturists:

Fruit ripens about the 20th of October, keeping qualities good; clusters medium to large, long, single-shouldered, tapering, loose; berries medium to small, roundish, pale greenish-yellow, thin bloom; skin and the adhering flesh medium tender and crisp, flesh surrounding seeds melting; flavor sweet, vinous; quality good.

PERKINS. *V. Labrusca.* At one time Perkins was grown largely as an early grape, but it has been discarded very generally on account of the poor quality of the fruit. The pulp of the grape is hard, and the flavor is that of Wyoming and Northern Muscadine, grapes characterized by disagreeable foxiness. As with nearly all Labruscas, the fruits of Perkins do not keep well. Notwithstanding

the faults of its fruit, the variety may have value in regions where grape-growing is precarious; for, in plant, it is one of the most reliable grapes cultivated, the vines being hardy, vigorous, productive, and free from fungal diseases. Perkins is an accidental seedling found about 1830 in the garden of Jacob Perkins, Bridgewater, Massachusetts.

Vine vigorous, hardy, healthy, productive. Canes long, numerous, thick, dark brown, deepening in color at the nodes, surface heavily pubescent; nodes enlarged, flattened; internodes long; tendrils continuous, bifid or trifid. Leaves medium in size, thick; lobes 3; petiolar sinus deep, narrow; serration shallow. Flowers self-fertile, early; stamens upright. Fruit early, ships well. Clusters of medium size and length, broad, cylindrical, often with a single shoulder, compact; pedicel short, thick, warty; brush long, yellow. Berries large, oval, pale lilac or light red with thin bloom, inclined to drop from the pedicel, soft; skin thin, tough, without pigment; flesh white, juicy, stringy, fine-grained, firm, meaty, very foxy; poor in quality. Seeds adherent, numerous, medium in size, notched.

PIERCE. *V. Labrusca.* Pierce is a bud sport from Isabella, originating about 1882 with J. P. Pierce, Santa Clara, California. The variety is rather commonly grown in the Pacific states, and is about the best representative of the Labrusca grapes for California, but is scarcely known in other grape regions, falling far short of other native grapes in the East.

Vines very vigorous, healthy, productive. Leaves remarkably large. Fruit late, clusters large; berries large, dull, black, oval, light bloom; skin rather thick and tough; flesh tender, juicy, sweet, strongly aromatic, quality fair to good; seeds 1 or 2, large, separating readily from the flesh.

POCKLINGTON. *V. Labrusca.* Before the advent of Niagara, Pocklington was the leading green grape. The variety has the fatal fault, however, of ripening its crop late, which, with some minor defects, has caused it to fall below Niagara for northern grape districts. Pocklington is a seedling of Concord and resembles its parent in vine-characters; the vines are fully equal or superior to those of Concord in hardiness, but are of slower growth and not quite so healthy, vigorous, nor productive. In quality, the grapes are as good as those of Concord or Niagara, if not better, being sweet, rich, and pleasantly flavored, although like the other grapes named, they have too much foxiness for critical consumers. Pocklington is not equal in quality to several other grapes of its season, as Iona, Jefferson, Diana, Dutchess, and Catawba, but it is far above the average and for this reason should be retained. John Pocklington, Sandy Hill, New York, grew Pocklington from seed of Concord about 1870.

Vine medium in vigor, hardy. Canes of medium length, number and size, dark reddish-brown; nodes enlarged, flattened; tendrils continuous, bifid or trifid. Leaves variable in size, thick; lobes 1-3 with terminus acuminate; petiolar sinus deep, wide; teeth narrow. Flowers self-fertile, midseason; stamens upright. Fruit late midseason, keeps and ships well. Clusters large, cylindrical, often single-shouldered, compact, pedicel short, thick, with a few small warts; brush short, green. Berries large, oblate, yellowish-green with tinge of amber, with thin bloom, firm; skin with scattering russet dots, thin, tender, adherent, faintly astringent; flesh light green with yellow tinge, translucent, juicy, tough, fine-grained, slightly foxy; good. Seeds adherent, 1-6, of medium length and breadth.

PURPLE CORNICHON. *V. vinifera. Black Cornichon.* By virtue of attractive appearance and excellent shipping qualities of the fruit, this variety takes high place among the commercial grapes of California. Late ripening is another quality making it desirable, while its curious, long, curved berries add novelty to its attractions. The fruit does not take high rank in quality. The description has been compiled.

Vine very vigorous, healthy and productive; wood light brown striped with darker brown, short-jointed. Leaves large, longer than wide, deeply 5-lobed; dark green above, lighter and very hairy below; coarsely toothed; with short, thick petiole. Bunches very large, loose or sometimes scraggly, borne on long peduncles; berries large, long, more or less curved, dark purple, spotted, thick-skinned, borne on long pedicels; flesh firm, crisp, sweet but not rich in flavor; quality good but not high. Season late, keeps and ships well.

REGAL. *V. Labrusca* × *V. vinifera.* Regal is an offspring of Lindley, which it greatly resembles. The fruit is attractive in appearance and is high in quality. A seemingly insignificant fault might make Regal undesirable in a commercial vineyard: the clusters are borne so close to the wood that it is difficult to harvest the fruit and avoid injury to the berries next to the wood. The variety is worthy of extensive culture in vineyards and gardens. Regal originated with W. A. Woodward, Rockford, Illinois, in 1879.

Vine vigorous, hardy, healthy, very productive. Canes intermediate in length and size, numerous, dark reddish-brown. Tendrils intermittent, bifid or trifid. Leaves large. Flowers self-fertile, midseason; stamens upright. Fruit midseason, keeps well. Clusters small, broad, cylindrical, usually with a short single shoulder, sometimes double-shouldered, very compact. Berries large, round, purplish-red with faint bloom, persistent; skin thin, tough, without pigment. Flesh pale green, very juicy; fine-grained, tender, musky; good. Seeds free, numerous, long, narrow, notched, blunt with a short neck, brown.

REQUA. *V. Labrusca* × *V. vinifera.* This is one of Rogers' hybrids, which hardly equals other grapes of its color and season. The grapes are attractive in cluster and berry and are of very good quality, but are subject to rot and ripen too late for northern regions. The variety was named Requa in 1869, but was previously known as No. 28.

Vine vigorous, hardy except in severe winters, medium in productiveness. Canes long, thick; tendrils continuous or intermittent, trifid or bifid. Leaves medium in size, dark green, often thick and rugose. Flowers semi-fertile, late; stamens reflexed. Fruit late, keeps long. Clusters large, cylindrical, often with a long, single shoulder, compact. Berries large, oval, dark, dull red covered with thin bloom, strongly adherent; flesh pale green, tender, stringy, vinous, foxy, sweet; good to very good. Seeds adherent, medium in size and length, broad, blunt.

ROMMEL. (*V. vulpina* × *V. Labrusca*) × *V. vinifera.* Rommel is rarely cultivated in the North, because the vines lack robustness, hardiness, and productiveness; are susceptible to the leaf-hopper; and the grapes do not attain high quality and crack as they ripen.

The bunch and berry are attractive in form, size, and color. At its best, Rommell produces good table-grapes, which make a fine white wine. It is worth growing in the South. T. V. Munson, Denison, Texas, originated Rommel in 1885, from seed of Elvira pollinated by Triumph, and introduced it in 1889.

Vine vigorous in the South. Canes long, numerous, thick, reddish-brown, surface roughened; nodes enlarged, often flattened; internodes short; tendrils intermittent, long, bifid or trifid. Leaves medium in size, round, thick; leaf not lobed, terminus acute to acuminate; petiolar sinus deep, narrow, often closed and overlapping; basal sinus lacking; lateral sinus shallow when present; teeth deep. Flowers semi-fertile, late; stamens upright. Fruit midseason, ships and keeps well. Clusters medium to short, broad, cylindrical, single-shouldered, compact; pedicel slender, smooth; brush short, pale green. Berries large, roundish, light green with a yellow tinge, glossy, persistent, firm; skin thin, cracks badly, tender, adherent, without pigment or astringency; flesh greenish, translucent, juicy, tender, melting, stringy, sweet; fair to good. Seeds free, 1-4, broad, sharp-pointed, plump, brown.

ROSAKI. *V. vinifera.* Rosaki is a table- and raisin-grape of southeastern Europe and Asia Minor. According to some of the California nursery companies, it is grown in that state under the name Dattier de Beyrough, although it would seem from French descriptions that there is a separate, very late variety of the latter name. Rosaki is similar to Malaga, and there is a possibility that in some of the warmer parts of the East it may be grown commercially as a substitute for the latter. The variety seems to be little grown on the Pacific slope.

Vine vigorous, usually very productive. Leaves large, roundish, rugose, usually 5-lobed; terminal lobe acuminate; petiolar sinus moderately deep to deep, medium broad; lower lateral sinus shallow, broad; margins broadly and bluntly dentate. Fruit ripens the third week in October, keeping qualities excellent. Clusters large, loose, tapering, shouldered. Berries large to very large, oval to long-oval, pale yellow-green; flesh translucent, tender, meaty, vinous, sprightly; quality good to very good.

ROSE OF PERU. *V. vinifera.* Rose of Peru is a favorite table-grape in California, confused with Black Prince and possibly the same. Its chief commendable characters are handsome appearance, high quality of fruit, and very productive vines. The fruits are not adapted for shipping and do not enter plentifully into commerce. Its season is so late that the variety is hardly worth trying in the East, and yet it has matured in favorable seasons at Geneva, New York. The following description is compiled:

Vine vigorous, healthy, productive; wood short-jointed, dark brown. Leaves of medium size; deep green above, lighter green and tomentose below. Bunches very large, shouldered, very loose, often scraggly. Berries large, round, black with firm, crackling flesh; skin rather thin and tender; flavor sweet and rich; quality very good to best. Season late, keeping rather well but not shipping well.

SALEM. Fig. 233. *V. Labrusca* × *V. vinifera.* Salem is the one of Rogers' hybrids of which the originator is said to have thought most, and to which he gave the name of his place of residence. The two chief faults, unproductiveness and susceptibility to mildew, are not found in all localities, and in favorable places, near good markets, Salem ought to rank high as a commercial fruit. The vine is hardy, vigorous, and productive, and bears handsome fruit of high quality. This variety was christened Salem by Rogers in 1867, two years earlier than his other hybrids were named.

233. Salem. (×⅓)

Vine vigorous, hardy, variable in productiveness. Canes long, dark brown; nodes enlarged; tendrils continuous or intermittent, long, bifid or trifid. Leaves variable in size; lobes 1-3 with terminus acute; petiolar sinus deep, narrow, often overlapping; basal sinus lacking; lateral sinus shallow, narrow, notched. Flowers sterile, midseason; stamens reflexed. Fruit early, keeps and ships well. Clusters large, short, broad, tapering, heavily shouldered, compact; pedicel short, thick, with small warts, enlarged at point of attachment to berry; brush short, pale green. Berries large, round, dark red, dull, persistent, soft; skin thick, adherent, without pigment, astringent; flesh translucent, juicy, tender, stringy, fine-grained, vinous, sprightly; good to very good. Seeds 1-6, large, long and broad, blunt, brown.

SCUPPERNONG. *V. rotundifolia. Bull. Bullace. Bullet. Fox Grape. Hickman. Muscadine. Roanoke.* Scuppernong is preëminently the grape of the South, the chief representative of the great species, *V. rotundifolia,* which runs riot in natural luxuriance from Delaware and Maryland to the Gulf, and westward from the Atlantic to Arkansas and Texas. Scuppernong vines are found on arbors, in gardens, or half wild, on trees and fences on nearly every farm in the South Atlantic states. As a rule, these vines receive little cultivation, are unpruned, and are given no care of any kind; but even under neglect they produce large crops. The vines are almost immune to mildew, rot, phylloxera, or other fungal or insect pests; they give not only an abundance of fruit, but, on arbors and trellises, are much prized for their shade and beauty. The fruit, to a palate accustomed to other grapes, is not very acceptable, having a musky flavor and a somewhat repugnant odor, which, however, with familiarity becomes quite agreeable. The pulp is sweet and juicy but is lacking in sprightliness. The grapes are not suitable for the market, because the berries drop from the bunch in ripening and become more or less smeared with juice, so that their appearance is not appetizing.

Vine vigorous, not hardy in the North, very productive. Canes long, numerous, slender, ash-gray to grayish-brown; surface smooth, thickly covered with small, light brown dots; tendrils intermittent, simple. Leaves

small, thin. Flowers very late; stamens reflexed. Fruit late, ripens unevenly, berries drop as they mature. Clusters small, round, unshouldered, loose. Berries few in a cluster, large, round, dull green, often with brown tinge, firm; skin thick, tough with many small russet dots; flesh pale green, juicy, tender, soft, fine-grained, foxy, sweet to agreeably tart; fair to good. Seeds adherent, large, short, broad, unnotched, blunt, plump, surface smooth, brown.

SECRETARY. *V. vulpina* × *V. vinifera.* Injured by mildew and rot, which attack leaves, fruit, and young wood, the vines of Secretary are able to produce good grapes only in exceptional seasons and in favored localities. The fruit-characters, however, give the grapes exceptionally high quality, for the berries are firm, yet juicy, fine-grained and tender, with a sweet, spicy, vinous flavor. The bunches are large, well-formed, with medium-sized purplish-black berries covered with thick bloom, making a very handsome cluster. While the vine and foliage somewhat resemble those of Clinton, one of its parents, the variety is not nearly so hardy, vigorous, or productive. Moreover, in any but favored localities in the North, the maturity of the crop is somewhat uncertain. These defects keep Secretary from becoming of commercial importance and make it of value only to the amateur. Secretary is one of the first productions of J. H. Ricketts, Newburgh, New York; the original vine came from seed planted in 1867.

Vine vigorous, doubtfully hardy, variable in productiveness. Canes numerous, light brown, conspicuously darker at nodes, surface covered with thin, blue bloom; tendrils intermittent, bifid. Leaves small to medium, thin. Flowers semi-fertile, early; stamens upright. Fruit ripens after Concord, keeps and ships well. Clusters large, long, cylindrical with a large, single shoulder, often loose and with many abortive fruits. Berries large, round, flattened at attachment to pedicel, dark purplish-black, glossy, persistent; firm; skin tough with wine-colored pigment; flesh green, juicy, fine-grained, tender, vinous, sweet; good. Seeds free, large, broad, notched, long, dark brown.

SULTANA. *V. vinifera.* This variety was formerly the standard seedless grape in California for home use and for raisins, but it is now outstripped by Sultanina. The fruits of Sultana are possibly better flavored than those of Sultanina, but the vines are hardly so vigorous or productive, and the berries often have seeds. Sultana is not worth trying in the East, as the season is too short for the maturity of the crop. The description is compiled.

Vine vigorous, upright, productive. Leaves large, five-lobed, with large sinuses, light in color, coarsely toothed. Bunches large, long, cylindrical, heavily shouldered, sometimes not well filled, often loose and scraggly. Berries small, round, firm and crisp, golden-yellow, sweet with considerable piquancy; quality good.

SULTANINA. *V. vinifera.* Sultanina is one of the standard seedless grapes of the Pacific slope, grown both to eat out of hand and for raisins. Probably it can be grown in home plantations in favored parts of eastern America where the season is long and warm. The following description is compiled from California viticulturists:

Vine very vigorous, very productive; trunk large with very long canes. Leaves glabrous on both sides, dark yellow-green above, light below; generally 3-lobed, with shallow sinuses; teeth short and obtuse. Bunch large, conico-cylindrical, well filled, with herbaceous peduncles. Berries oval, beautiful golden-yellow color; skin moderately thick; flesh of rather neutral flavor; very good.

THOMAS. *V. rotundifolia.* Thomas is a variety of Rotundifolia discovered in the woods near Marion, South Carolina, by Drewery Thomas about 1845. It has long been considered one of the standard Rotundifolia grapes for the South.

Vine vigorous, healthy, very productive. Leaves cordate, rather large, longer than broad, thick; margins coarsely serrate. Fruit midseason, borne in clusters of from 4 to 10, medium to large; skin thin, dotted with pimples, varying in color from reddish purple to black, marked at the base with greenish-yellow; pulp tender, sweet, vinous; quality good to very good.

TRIUMPH. *V. Labrusca* × *V. vinifera.* When quality, color, shape, and size of bunch and berry are considered, Triumph is one of the finest dessert grapes of America. At its best, the fruit is a magnificent bunch of golden grapes of highest quality, esteemed even in southern Europe, where it must compete with the best of the Viniferas. In America, however, its commercial importance is curtailed by the fact that the fruit requires a long season for proper development. Triumph has, in general, the vine-characters of the Labrusca parent, Concord; it has Concord's habit of growth, vigor, productiveness, and foliage-characters, falling short of this parent in hardiness, resistance to fungal diseases, and earliness of fruit. While the vine-characters of Triumph are those of Labrusca, there is scarcely a suggestion of the foxy odor and taste of Labrusca, and the objectionable seeds, pulp, and skin of the native grape give way to the far less objectionable structures of Vinifera. The flesh is tender and melting, and the flavor rich, sweet, vinous, pure, and delicate. The skins of the berries under unfavorable conditions crack badly; the variety, therefore, neither ships nor keeps well. Triumph was grown soon after the Civil War by George W. Campbell, Delaware, Ohio.

Vine vigorous. Canes long, dark brown with much bloom; nodes enlarged; tendrils intermittent, long, trifid, sometimes bifid. Leaves large; leaf usually not lobed with terminus obtuse; petiolar sinus deep, narrow, often closed and overlapping; basal sinus absent; lateral sinus shallow and narrow when present; teeth deep, wide. Flowers self-fertile, late; stamens upright. Fruit very late. Clusters very large, long, broad, cylindrical, sometimes single-shouldered, compact; pedicel slender, smooth; brush short, yellowish-green. Berries medium in size, oval, golden yellow, glossy with heavy bloom, persistent, firm; skin thin, inclined to crack, adherent, without pigment, slightly astringent; flesh light green, translucent, juicy, fine-grained, tender, vinous; good to very good. Seeds free, 1-5, small, brown.

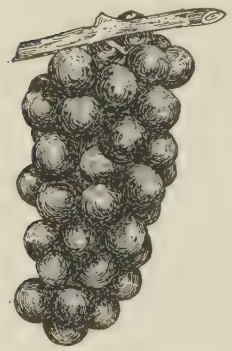
ULSTER. *V. Labrusca.* The vines of Ulster set too much fruit, in spite of efforts to control the crop by pruning; two undesirable results follow, the bunches are small and the vines, lacking vigor at best, fail to recover from the over-fruitfulness. These defects keep the variety from becoming of importance commercially or even a favorite as a garden

grape. The quality of the fruit is very good, being much like that of Catawba; under favorable conditions the grapes are an attractive green with a red tinge. The fruit keeps well when the variety is grown under conditions suited to it. Ulster originated with A. J. Caywood, Marlboro, New York, and was introduced by him about 1885.

Vine hardy, productive, overbears. Canes short, slender, dark brown, surface roughened and covered with faint pubescence; nodes enlarged and flattened; internodes short; tendrils intermittent, bifid, dehisce early. Leaves small, thick; leaf usually not lobed with terminus acute; petiolar sinus medium to wide; basal sinus absent; lateral sinus a notch when present; teeth shallow, wide. Flowers self-fertile, early; stamens upright. Fruit late midseason. Clusters long, cylindrical, often single-shouldered, compact; pedicel slender, with numerous warts; brush short, yellowish-green. Berries medium in size, round, dark dull red with thin bloom, persistent; skin thick, tough, adherent, astringent; flesh pale green, translucent, juicy, tender, fine-grained, faintly aromatic, slightly foxy; good to very good. Seeds free, 1-6, medium in size, plump, brown.

VERDAL. *V. vinifera. Aspiran Blanc.* Verdal is one of the standard late grapes of the Pacific slope, its crop ripening about the latest. The grapes are seen but seldom in distant markets, and their quality is not quite good enough to make the variety a very great favorite for home plantations. Vigor and hardiness of vines commend Verdal, as do the large and handsome fruits, and these qualities, with late ripening, will probably long keep it on grape lists in the far West. The description is compiled.

Vine vigorous, hardy, healthy, and productive; canes rather slender, half erect. Leaves of medium size, glabrous on both surfaces, except below near the axis of the main nerve; sinuses well marked and generally closed, giving the leaf the appearance of having 5 holes; teeth long, unequal, acuminate. Bunches large to very large, irregular, long-conical, usually compact; shoulders small or lacking. Berries large or very large, yellowish-green; skin thick but tender; flesh crisp, firm; flavor agreeable but not rich; quality good. Season very late, keeping and shipping well.



234. Vergennes. (×⅓)

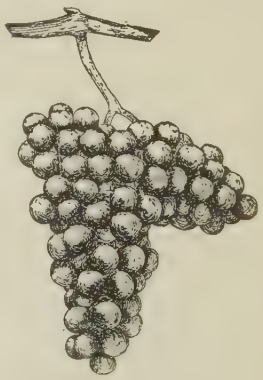
VERGENNES. Fig. 234. *V. Labrusca.* The most valuable attribute of Vergennes is certainty in bearing. The vine seldom fails to bear, although it often overbears, and this habit causes variability in size of fruits and time of ripening. With a moderate crop, the grapes ripen with Concord, but with a heavy load from one to two weeks later. Vergennes is unpopular with vineyardists because of the sprawling habit of the vines, which makes them untractable for vineyard operations; this fault is obviated by grafting on other vines. The grapes are attractive, the quality is good, flavor agreeable, flesh tender, and seeds and skin are not objectionable. Vergennes is the standard late-keeping grape for northern regions, and is common in the markets as late as January. The original vine was a chance seedling in the garden of William E. Greene, Vergennes, Vermont, in 1874.

Vine variable in vigor, doubtfully hardy, productive, healthy. Canes long, dark brown; nodes enlarged, strongly flattened; tendrils continuous, long, bifid or trifid. Leaves large, thin; leaf usually not lobed with terminus broadly acute; petiolar sinus wide; teeth shallow. Flowers semi-sterile, midseason; stamens upright. Fruit late, keeps and ships well. Clusters of medium size, broad, cylindrical, sometimes single-shouldered, loose; pedicel with numerous small warts; brush slender, short, pale green. Berries large, oval, light and dark red with thin bloom, persistent; skin thick, tough, adherent, astringent, flesh pale green, juicy, fine-grained, somewhat stringy, tender, vinous; good to very good. Seeds free, 1-5, blunt, brown.

WILDER. *V. Labrusca* × *V. vinifera.* The fruit of Wilder is surpassed in quality and appearance by that of others of Rogers' hybrids, but the vine is more reliable than in any other of these hybrid sorts, being vigorous, hardy, productive, and, though somewhat susceptible to mildew, as healthy as any. Wilder is not so well known in the markets as it should be, and, now that fungal diseases can be controlled by spraying, should be more commonly planted in commercial vineyards, especially for local markets. Wilder is one of the forty-five Labrusca-Vinifera hybrids raised by E. S. Rogers, Salem, Massachusetts, and was described first in 1858.

Vine vigorous, hardy, productive, susceptible to mildew. Canes long, numerous, reddish-brown, darker at the nodes; internodes long; usually not lobed with terminus acute; petiolar sinus deep, narrow, often closed and overlapping; basal sinus lacking; lateral sinus shallow, narrow, or a mere notch when present. Flowers self-sterile, midseason; stamens reflexed. Fruit early midseason, keeps and ships well. Clusters variable in size, short, broad, tapering, heavily single-shouldered, loose; pedicel long, thick, with numerous warts; brush thick, green with tinge of red. Berries large, oval, purplish-black with heavy bloom, persistent, firm; skin thick, adherent to pulp, with bright red pigment, astringent; flesh green, translucent, juicy, tender; good. Seeds adherent, 1-5, long, light brown.

WINCHELL. Fig. 235. *V. Labrusca. Green Mountain.* The vines of Winchell are vigorous, hardy, healthy, productive, and the fruit is early, of high quality, and ships well—altogether a most admirable early grape. There are some minor faults. The berries, and under some conditions the bunches, are small, and the bunch is loose, with a large shoulder. Sometimes this looseness becomes so pronounced as to give a



235. Winchell. (×⅓)

straggling, poorly-formed cluster; and the shoulder, when as large as the cluster itself, which is often the case, makes the cluster unsightly. The grapes shell when fully ripe. Again, while the crop usually ripens evenly, there are seasons when two pickings are needed because of unevenness in ripening. Lastly, the skin is thin and there is danger in unfavorable seasons of the berries cracking. These defects do not offset the several good characters of Winchell, which make it the standard early green grape. The original vine was raised by James Milton Clough, Stamford, Vermont, about 1850.

Vine vigorous, hardy, healthy, very productive. Canes long, numerous, slender, dark brown with thin bloom; nodes enlarged, flattened; tendrils continuous, sometimes intermittent, bifid. Leaves large; lobes 3-5, with terminal lobe acute; petiolar sinus deep; basal sinus shallow; teeth shallow, wide. Flowers fertile, midseason; stamens upright. Fruit early, keeps and ships well. Clusters long, slender, cylindrical, often with a long shoulder, compact; pedicel short, slender, with few inconspicuous warts; brush greenish-white. Berries small, round, light green, persistent, soft; skin marked with small, reddish-brown spots, thin, tender, slightly astringent; flesh green, translucent, juicy, tender, fine-grained, sweet; very good to best. Seeds free, 1-4, small, plump, wide and long, blunt, brown.

WOODRUFF. *V. Labrusca.* Woodruff bears large, handsome, showy, brick-red grapes in large clusters, but taste belies looks, for the flesh is coarse and the flavor is poor. The variety would not be worth attention, were it not for its excellent vine-characters, the vines being hardy, productive, and healthy. The grapes ripen a little before those of Concord and come on the market at a favorable time, especially for a red grape. Woodruff originated with C. H. Woodruff, Ann Arbor, Michigan, as a chance seedling which came up in 1874.

Vine very vigorous, hardy. Canes dark brown; nodes enlarged, flattened; tendrils continuous, bifid or trifid. Leaves round; leaf usually not lobed with terminus acute; petiolar sinus wide; basal sinus lacking; lateral sinus shallow and narrow when present; teeth shallow. Flowers semi-fertile, early; stamens upright. Fruit ripening before Concord. Clusters broad, widely tapering, usually single-shouldered, compact; pedicel short, thick, smooth; brush long, pale green. Berries large, round, dark red, dull, firm; skin thin, tender, adherent, slightly astringent; flesh pale green, translucent, juicy, tough, coarse, very foxy; fair in quality. Seeds adherent, 1-5, broad, short, plump, blunt, brown.

WORDEN. Fig. 236. *V. Labrusca.* Of the many offspring of Concord, Worden is best known and most meritorious. The grapes differ from those of Concord in having better quality and in being a week to ten days earlier. The vine is equally hardy, healthy, vigorous, and productive, but is more fastidious in its adaptations to soil, though now and then it does even better. The chief fault of the variety is that the fruit cracks badly, often preventing the profitable marketing of a crop. The fruit-pulp of Worden is softer than that of Concord, there is more juice, and the keeping qualities are not so good. Worden is very popular in northern grape regions both for commercial plantations and for the garden. It is a more desirable inhabitant of the garden, because of higher quality of fruit than Concord, and, under conditions well suited to it, is better as a commercial variety, since the fruit is handsomer as well as of better quality. Early season is against Worden, for a commercial variety, and, with the defects mentioned, prevents it taking the place of Concord to a great degree. Worden was originated by Schuyler Worden, Minetto, New York, from seed planted about 1863.

236. Worden. (×⅓)

Vine vigorous, hardy, healthy, productive. Canes large, thick, brown with reddish tinge; nodes enlarged, flattened; tendrils continuous, slender, bifid, sometimes trifid. Young leaves tinged on the under side and along the margins of upper side with rose-carmine. Leaves large, thick; leaf usually not lobed; petiolar sinus wide, often urn-shaped; teeth shallow. Flowers fertile, midseason; stamens upright. Fruit early. Clusters large, long, broad, tapering, usually single-shouldered, compact; pedicel slender with a few small warts; brush long, light green. Berries large, round, dark purplish-black, glossy with heavy bloom, firm; skin tender, cracks badly, adheres slightly, contains dark red pigment, astringent; flesh green, translucent, juicy, fine-grained, tough, foxy, sweet, mild; good to very good. Seeds adherent, 1-5, large, broad, short, blunt, brown.

WYOMING. *V. Labrusca. Hopkins Early Red. Wilmington Red.* Such value as Wyoming possesses lies in the hardiness, productiveness, and healthiness of the vine. The appearance of the fruit is very good, the bunches being well formed and composed of rich amber-colored berries of medium size. The quality, however, is poor, like that of the wild Labrusca in foxiness of flavor and in flesh-characters. Wyoming is not nearly so valuable as some others of the red Labruscas hitherto described, and can hardly be recommended either for the garden or for the vineyard. The variety was introduced by S. J. Parker, Ithaca, New York, who states that it came from Pennsylvania in 1861.

Vine vigorous, hardy, healthy, productive. Canes numerous, slender, dark reddish-brown covered with blue bloom; nodes enlarged, frequently flattened; tendrils continuous, short, bifid. Leaves of average size and

thickness; lobes 1-3, with terminus acute; petiolar sinus shallow, wide; basal sinus usually wanting; lateral sinus shallow and wide when present; teeth shallow. Flowers sterile, midseason; stamens reflexed. Fruit early, keeps well. Clusters slender, cylindrical, compact; pedicel short, slender with small warts; brush slender, pale green with brown tinge. Berries medium, round, rich amber red with thin bloom, persistent, firm; skin tender, adherent, astringent; flesh pale green, translucent, juicy, tough, solid, strongly foxy, vinous; poor in quality. Seeds adherent, 1-3, slightly notched, light brown.

PART IV

THE BRAMBLES

CHAPTER XV

BOTANY OF THE BRAMBLES

A bramble is any plant of the genus Rubus. According to this definition, there are not less than 400 species the world over, and conservative authorities describe that number to which more than 3000 species names have been applied. To add confusion to the classification of the brambles, there are many hybrids. Few of this vast number of species and hybrids are cultivated for their fruits, and not more than twenty or twenty-five are found in orchards and gardens. These cultivated brambles pass under several group names, commonest of which are blackberry, dewberry, Himalaya berry, loganberry, lowberry, raspberry, and wineberry. Less common brambles are the cloudberry and salmonberry.

The fruits of brambles are known by all as berries. The berry of a bramble is an aggregation of drupelets, each drupelet a carpel. At maturity, the drupelets composing a berry are coherent in all pomological brambles. In blackberries and dewberries, the drupelets adhere to the torus, which at maturity separates from the plant; this torus is the familiar core of these fruits. In the raspberry, the mass of drupelets separates from the torus, forming a hollow, thimble-like fruit.

There are probably a thousand or more cultivated varieties of the several brambles. To classify the species and their varieties, some of which show but few and slight differences, requires intimate knowledge of the morphological characters which can be used for classification.

CHARACTERS USEFUL IN CLASSIFYING BRAMBLE-FRUITS

The plant.

The canes of brambles, usually woody but sometimes herbaceous or semi-herbaceous, spring from perennial rootstocks. The first year's growth is a simple or slightly branched stem which bears leaves only. This yearling stem is the turion of the botanist, the sucker of the fruit-grower. The second year the turion becomes a cane and bears fruiting branches. The only exception to this manner of growth in cultivated brambles is the everbearing red raspberry, which bears fruit late in the season on the turion.

The manner in which plants naturally propagate themselves offers a distinguishing characteristic for several species, and obviously is of much importance to the cultivator. Black raspberries, the purple-cane raspberries, dewberries, and loganberries naturally reproduce from tips which curve over and take root in the ground in the autumn. All other brambles, red raspberries and blackberries being the most conspicuous examples, reproduce from suckers. These are the natural habits of reproduction; the propagator may use layers and cuttings, and by special treatment may induce a species to change its natural method to suit his convenience. Some brambles, as the blackberry, are largely propagated in the nursery from root-cuttings.

In describing the stems of brambles, differences in the turion and canes must be noted. The two structures often vary distinctly in habit of growth; one may be erect, the other drooping. They often differ in cross-section; the one may be cylindrical, the other angular. One may be pubescent or spiny, the other glabrous and spineless. The color of yearling and of the two-year-old wood, and the amount and character of the bloom may vary. With both, whether stocky or slender, the shape and the color are matters of major importance. If the stems are angular, the surfaces of the faces must be noted, whether concave, convex, or canalized; the character of the angle, whether acute or obtuse, is sometimes important. The canes of the Mammoth blackberry are exceptionally thick and are covered with small spines.

Especial attention must be paid to the color of the stems and to the bloom. The stems of cultivated brambles may be tints and shades of green, yellow, brown, red, and purple. These colors may be dull or glossy. The bloom is characteristic in many species in amount and in constancy, although the presence or absence of bloom sometimes depends on the location of the plant.

Presence or absence of armament and the character of the armament furnish information of capital importance in distinguishing species. All of the species of brambles are pubescent, prickly or thorny, while the shoots of some are both pubescent and prickly. One species of blackberry, *R. Millspaughii,* Brit., is thornless, and there are thornless varieties of thorny species. In some species the prickles are of equal size and the same form; in others the prickles are of unequal size and of different forms. In the European raspberry the prickles are nearly straight and are slender; they are much stiffer in the American red raspberry; these structures are straight spines in the black raspberry; and are stout and curved in most blackberries and dewberries. It may be noted, also, that the spines or thorns are regularly arranged in some species and are not so in

others. Some species, as the American red raspberry, bear gland-tipped hairs or bristles on the flowering shoots.

Temperature and pests.

The different species of Rubus and their varieties vary greatly in their relation to heat and cold, and their response to these environmental factors must always be noted. The cultivated varieties of the several species of Rubus seldom thrive quite so far north or so far south as their wild prototypes, chiefly because the wild plants find natural protection difficult for the cultivator to give.

The relation of the various brambles to insects and diseases is of rather less importance to both the systematic pomologist and the fruit-grower than with other plants, for the reason that insects and fungi are less troublesome. But, even so, it is of importance to note characteristic immunities or susceptibilities.

The foliage.

The leaves of species and varieties furnish characters upon which specific divisions are often made. Thus the number of leaflets, the size, shape, and color are all very important. The leaflets of some species are smooth, rugose, plicate, or wrinkled. The colors of the upper and lower surfaces vary greatly; that of the lower surface is particularly to be taken into account. The pubescence on the surfaces, petioles, and margins differs greatly; in some species the hairs are glandular. The petiole and midrib are often armed like the canes. Sometimes the petiole is channeled and sometimes flat. The serrations of the margins are most serviceable taxonomic characters, in one species, *R. laciniatus,* being so laciniated as to give the name to the group. In other species the serrations may be fine, coarse, sharp, obtuse, and regular or irregular; or the teeth may appear in a single or a double series. These characters of the margin usually persist under cultivation.

The time at which leaves appear and their color in the early spring are noteworthy, and information is easily obtained in fruit plantations. Possibly an even more important life event is the fall of leaves. Some cultivated species, as *R. laciniatus,* the cut-leaved or evergreen blackberry, are almost or quite evergreen. Some others of the blackberries and dewberries are nearly evergreen, all such being tender to cold. The Mammoth blackberry, the loganberry, and their several related sorts, are examples of this class.

The flowers.

The inflorescence is not so reliable for classification as several other structures, for cultivation seems to have modified the flowers in many species, and hybridization has caused great diversities. The inflorescence is a corymb or raceme, either of which may vary greatly in being long or short, dense or open, in having the peduncles entire or divided, few- or many-flowered. Pubescences, spines, and glands are almost as various as the species. The cluster may be naked or covered to the tip with leafy bracts. The peduncle may be erect, spreading, or drooping. The length, size, and color of peduncle and pedicel are noteworthy, and note should be made as to whether they are glabrous, pubescent, or glandular. The angle the pedicel makes with the axis is a fine mark of distinction; it may be acute, obtuse, or at right angle. The floral structures are of importance in the classification of species; pomologists, however, use them but little in classifying cultivated brambles. The date of bloom is of cultural as well as of taxonomic importance and must be taken into account.

The size and color of the floral parts is easily noted and very constant, therefore of importance. A fine mark of distinction in species and varieties is the direction of the sepals after flowering. At the time of flowering, the sepals in nearly all brambles are reversed; in some species they remain reversed until the fruits mature, but in others they change position, varying with the species from the reversed form through all stages to clasping the fruit. The sepals vary greatly also in different species, in size, shape, and color, and may be pubescent or glabrous, glandular or eglandular.

The form of the petals is constant in species of Rubus, but the color is rather variable. In cultivated varieties of a species, the color may vary from white to red, as is the case with *R. laciniatus,* the cut-leaved blackberry. In most of the cultivated brambles, however, the color is white in all varieties.

The relative length and color of stamens and pistils, and their pubescent or glabrous condition, are facts of considerable botanical importance, but need seldom be considered by the pomologist. The western dewberries, *R. vitifolius,* often bear imperfect flowers, so that degree of sterility in their many hybrid offspring should be noted by pomologists. In hybrid brambles, the pollen is often found to be shrunken or otherwise malformed. All who have worked with cultivated brambles must have noted in times of drought that there are many sterile or practically sterile flowers. Certain species and certain varieties of any given species are more susceptible to this defect than others.

The fruit.

Lastly, in the fruits, two characters important to the pomologist are the date of ripening and the yield, both of which are of taxonomic importance. All species and varieties have a definite fruiting season, the beginning and end of which are life events to be noted in a full description of every variety. The fruits of some varieties are uniform in shape and size throughout the season, both matters of importance but too dependent on environment to have much taxonomic importance. Yield, also, of utmost cultural importance, is too variable in accordance with climate, soil,

and care to be of great use in classification, but has significance with some brambles.

As with all fruits, size, shape, and color of the product are about the most important characters to be taken into account in descriptions of varieties. The English vocabulary furnishes an abundance of easily understood words to characterize size, shape, and color, but the words must be chosen with care to present an accurate mental picture. The size and shape of the cluster must be noted, and, with some brambles, the size and shape of the drupelets in a berry should be described.

With raspberries, it is a matter of considerable moment to the grower whether the berry adheres strongly to the torus or readily parts from it. Similarly, it must be known of every variety of blackberry how well the fruit clings to the pedicel; it should not cling too tightly nor, on the other hand, drop too readily as the crop ripens.

If the size and shape of the cavity are out of the ordinary in raspberries, the fact must be recorded. The size and texture of the core of blackberries and dewberries must be accounted for, as a core too large or too hard or too soft, is undesirable. The shape of the core is of some importance in separating blackberries and dewberries; it may be conical or cylindrical, short or elongated. The core is usually white, but may be pink or reddish. The coherence of the drupelets varies with the species and often with the variety in brambles, hence is of taxonomic value and a character of importance in marketing the crop, since crumbly berries do not ship well and are not attractive.

The color of bramble-fruits must be described with especial attention. The colors range from white through yellow, amber, and purple to black. There are almost innumerable tints and shades of these colors, and it is most difficult to convey with accuracy the exact color. The drupelets may be bright and glossy or dull and clouded. A few fruits of the brambles have a well-marked and characteristic bloom.

It is extremely difficult to describe the flavor of bramble-fruits, and yet no two varieties have quite the same taste. The usual words —sweet, sour, subacid, sprightly—are used, but always qualified by such adverbs as very, mild, and the like. Yet these mean little with berries unless they possess some peculiarity, such as bitterness, muskiness, or richness. Some berries have an aroma that distinguishes them.

The word texture is used much with drupes as with pomes, yet it is quite a different thing. In the tree-fruits texture is a quality of the flesh, but in berries skin, flesh, seeds, and core give texture. Nevertheless, much the same terms are used in describing the texture as in the larger fruits; thus, the brambles are spoken of as coarse or fine-grained, tough or tender, hard, soft, or melting, and seedy or free from seeds. As with other fruits, berries may be juicy or dry. It is sometimes worth while noting the color of the juice. A statement must be made as to whether the seeds are large or small, hard or soft, and as to what the color is.

Quality is rated as in testing other fruits. The characters that make the berries pleasant to the palate—flavor, texture, aroma, juiciness —give quality. Quality is described as poor, fair, good, very good, and best. Depending chiefly on quality, somewhat on texture, berries are designated for use, the various uses being for dessert, kitchen, market, home, and evaporating.

The description blank for the raspberry on the next page sets forth most of the characters students and fruit-growers will use in describing bramble-fruits.

SPECIES OF BRAMBLE-FRUITS

The genus Rubus confuses both botanist and pomologist. There are many species between which the differences are often slight and obscure; and species differ greatly in accordance with age of plant, locality, soil, season, and growth in sun or shade. Some botanists prefer to unite the many forms into a few generalized species, while others, fond of trivial distinctions, make many species. To confuse still further, brambles hybridize in nature and are easily hybridized by man, so that there are now some natural groups undoubtedly originating in hybridization and many artificial groups have been so produced. Under cultivation, natural species vary more than in the wild state, adding more difficulties to a close classification of the plants in this variable genus. These considerations must be weighed by the systematic pomologist, and a conclusion arrived at as to whether he will follow the old practice of dividing the genus into a few generalized species or name and describe each distinct form.

The second is the better method of classification, if knowledge or material is at hand to make use of it. The pomologist wants to know all that can be known of the plants he is cultivating, and a classification that takes into consideration all of the characters of brambles gives him the fullest knowledge. In that sort of classification many species are made. But in the present state of knowledge of Rubus, a close classification of the cultivated forms of the genus is impossible. Raspberries are less diverse in wild forms than blackberries and dewberries, and may be put in species with a fair degree of certainty, but it is impossible to classify with a high degree of satisfaction the last-named brambles. Much critical study must be given this genus by the botanist before the pomologist can harmoniously classify domesticated with wild forms.

In the present state of knowledge, therefore, it seems best to attempt to describe fully only the cultivated species of raspberries, grouping blackberries and dewberries into two groups of distinct species, which have important characters in common.

The score or more cultivated forms of Rubus come from temperate Europe and

DESCRIPTION BLANK FOR THE RASPBERRY

Name..... Plat ..... Row..... Date..... 19....

PLANTS

Characteristics .....
Tall, medium, dwarf
Vigorous, medium, weak
Upright, spreading, drooping

PROP. BY SUCKERS.....TIPS.....
Hardy, half-hardy, tender
Very productive, productive
Medium productive, unproductive

SUSCEPTIBILITY to
Insects .....
Diseases .....

SUCKERS
Numerous, medium, few, none

CANES
Stocky, medium, slender
Red, brown, yellow
Green, gray, purple
Dull..... glossy.....
Pubescent..... glabrous..... glaucous.....
With glandular tips

Spines or prickles
Thick, medium, slender
Strong, medium, weak
Straight..... hooked.....
Sharp..... blunt.....
Numerous, medium, few, none
Distribution .....
Color .....

LEAFLETS
Number .....
Large, medium, small
Lanceolate, ovate, obovate
Oval, oblong, wedge, roundish

Upper surface
Light, medium, dark green
Dull..... glossy.....
Smooth or roughened

Lower surfacec
Whitish, greenish

Pubescent..... glabrous.....

Tomentose

Margin
Dentate, crenate, serrate
Even or uneven
Single or double series
Jagged, hairy
Lobed, glandular

Petiole
Long, medium, short
Thick, medium, slender
Spiny..... prickly..... thorny.....
Pubescent..... glabrous..... glandular.....

FLOWERS
Date of bloom .....
Season early, medium, late
Large, medium, small
White ..... rose .....
Glandular, pubescent, glabrous

FRUIT

Characteristics .....
Early, midseason, late

DATE OF RIPENING .....

LENGTH OF SEASON .....

BORNE HOW .....

NUMBER OF PICKINGS .....

KEEPING QUALITY .....

SHIPPING QUALITY .....

PICKING QUALITY .....

SUSCEPTIBILITY to
Insects .....
Diseases .....
Sun-scald .....

ADHERENCE
Strong, medium, weak
Large, medium, small
Uniform or variable
Retains size through season, drops
Regular, irregular
Long, medium, short
Broad, roundish, conic

BLOOM .....

STYLES .....

DRUPES
Large, medium, small
Numerous, medium, few

Coherence
Strong, medium, crumbly
Whitish, yellow, amber
Light, medium, dark red
Purple, black
Dull..... glossy.....
Juicy, medium, not juicy
Tough, medium, tender
Firm, melting, seedy
Sweet, insipid, subacid
Sprightly, sour
High-flavored, aromatic

Quality
Best, very good, good
Fair, poor, very poor

USE
Dessert, kitchen, market
Home, drying

DESIRABILITY .....
.....
.....

REMARKS .....
.....
.....

North America, but some promising forms now grow wild in temperate Asia, and several brambles furnish wild food in temperate South America. Even the tropics in the northern hemisphere are enriched by a few species of edible brambles, none of which, however, is cultivated. Rubus belongs to the order of Rosaceæ and is closely related to the genus Rosa, from which it differs chiefly in the structure of the flower and fruit.

Plants evergreen or deciduous; shrubby, climbing, or running; thorny, prickly or rarely unarmed; variously pubescent or glabrous, sometimes glandular; tips of canes usually recurving. Leaves alternate, petiolate, stipulate; simple or compound, usually palmately lobed or palmately compound; stipules free or jointed to the base of the petiole. Flowers sometimes solitary but usually many-flowered in corymbs or racemes; white, pink, rose-colored or red; calyx composed of a little cup with 5 persistent sepals crowning it; petals 5, conspicuous, deciduous; stamens numerous, inserted on the margin of the cup; pistils many, inserted on the rising bottom of the cup, becoming juicy drupelets in all of the cultivated species.

The genus naturally divides into several subgenera, of which the pomologist is interested in but two. Idæobatus, the raspberries; and Eubatus, the blackberries and dewberries.

Idæobatus. Red, purple, black, white or yellow raspberries, the fruit composed of coherent drupelets and coming loose from a moist torus; the cultivated species, erect or ascendent shrubs; flowers mostly in short clusters.

Eubatus. Very dark red, black, or rarely white, blackberries and dewberries, the drupelets adhering to the torus; cultivated species erect, trailing or climbing; flowers panniculate or racemose.

RASPBERRIES

1. *R. idæus,* Linn. European Raspberry. Canes stiff and upright, light colored, glandular when young, beset with nearly straight, slender prickles. Leaves compound with 3-5 leaflets which are oblong-ovate, pointed, irregularly serrate, downy-white underneath, lateral ones sessile, usually more or less wrinkled. Flowers small, white, borne in long interrupted clusters; peduncles dividing into 2 or 3 pedicels; the flowering shoots as well as the petioles and midribs finely pubescent and sparingly furnished with firm, recurved prickles; calyx velvety, sometimes with a few prickles; petals as long as the sepals. Fruit oblong or conical, light or dark red, white or yellow, borne more or less continuously throughout the season.

The European raspberry is a native of Europe from Greece and Italy, north into Scandinavia and far eastward into Asia. It was named for Mount Ida, in Asia Minor, and was possibly more or less cultivated in southern Europe in ancient times, although a cursory search does not reveal statements to that effect. In England, Turner, the herbalist, in 1538, says it grows in English gardens, and in 1629, Parkinson, another herbalist, mentions both white and red varieties.

This species furnishes the European varieties of the cultivated raspberries, black and purple raspberries being scarcely known in the Old World. It was early brought to America by colonists from Europe, and prior to the middle of the nineteenth century was the only raspberry commonly cultivated in this country, as many as sixty-seven varieties being described in 1867. Pure-bred European raspberries are now practically driven from cultivation by the hardier, healthier, and more productive American species. No doubt there are some hybrids with American raspberries. The species is occasionally found wild in northeastern United States as an escape from cultivation. Antwerp, Fastolf, Franconia, Orange, and Vermont are typical varieties still found in an occasional garden in the United States. The species is propagated from suckers.

2. *R. strigosus,* Michx. American Red Raspberry. This species is much like the last, and many botanists combine the two. They are separated, however, by several marked differences. Thus, the habit of growth of the American species is more open; the canes are more slender, are darker in color, more glaucous, and the prickles are stiffer; the leaves are thinner; the flowering shoots, petioles and calyx are beset with gland-tipped hairs and bristles; the calyx is less pubescent; the flower-clusters are more open; the fruit is a lighter red, white- and yellow-fruited forms are much rarer; and the tendency to fruit continuously is lacking.

The species is common in northern United States and southern Canada, westward to the Rocky Mountains, and on the Pacific coast northward to Alaska. It is found also in Asia. The red species is hardier and ranges farther north than the black raspberry, with which it is often associated in northern United States. Cuthbert, Marlboro, June, and Loudon are typical varieties. Propagation is by suckers.

Named varieties of the American red raspberry were not introduced until about 1860, although it now appears that at least two and possibly three varieties of this species had been passing for some years previous as offspring of *R. idæus.* The culture of this fruit, however, received its first impetus with the introduction of the Cuthbert in 1865. Pomological literature contains records of no less than 150 varieties that have been introduced since 1860, although probably not more than forty or fifty kinds are now offered by nurserymen.

Students of this variable genus have separated two or three other species and at least two botanical varieties from *R. strigosus,* of which but one other form, var. *albus,* Fuller, is of importance to pomologists. This variety bears amber-white fruits, and to it have been referred some of the white-fruited varieties under cultivation.

3. *R. occidentalis,* Linn. Black Raspberry. Blackcap. Thimbleberry. Canes strong, erect, glaucous, not bristly, beset with hooked spines; recurving and rooting at the tips. Leaves compound with 3 or rarely 5 leaflets which are ovate, pointed, sharply serrate and notched, white beneath; petioles armed with prickles; lateral leaflets usually stalked. Flowers borne in small, dense, prickly clusters; petals shorter than the sepals. Fruit black or sometimes amber-white, rather small, hemispherical, firm; ripens later than the red raspberry.

The black raspberry ranges south from New Brunswick and southern Quebec to Georgia and Missouri, and westward to Oregon, Washington, and British Columbia. A botanical form, var. *pallidus,* Bailey, with yellow-amber fruit, is sometimes found growing wild. This species is usually to be found in fence-rows, in copses, and along roadsides, a common and useful food-plant, although sometimes a pestiferous weed in vast regions throughout the

extensive territory in which it is found. Gregg, Ohio, Kansas, and Cumberland are typical black raspberries.

The first act toward formal domestication seems to have taken place in 1832, when Nicholas Longworth, an early horticulturist of note in Cincinnati, transferred a wild plant to his garden. The plant thus brought under cultivation was the Ohio Everbearing, a variety which long remained a standard. The growing of black raspberries can hardly be said to have become an established industry until after 1850, when H. H. Doolittle, Oaks Corners, New York, introduced the Doolittle, a vigorous, hardy, productive, large-fruited sort which was easily propagated from the tips of one-year-old plants. The spread of this variety, together with the discovery that black raspberries could be easily cured into dried fruits, did much to establish the cultivation of this berry.

The black raspberry thrives so remarkably well under cultivation, the plants being vigorous and productive, that until the beginning of the present century it was probably more widely cultivated than the native red raspberry. Its adaptability for evaporation, because of firm flesh, and because the crop ripens in a short season, also gives stimulus to its cultivation. But fungus diseases, especially anthracnose, take so great a toll from the black raspberry, and evaporated fruit is giving way to the canned product so rapidly, that the black raspberry is now much less popular than the red, with the prospect that the purple-cane varieties will soon overtake the black sorts. Possibly no fruit is more easily improved, however, than the black raspberry, seedlings of crossed varieties usually showing a large percentage of improved offspring, so that the introduction of better varieties may give the cultivation of this fruit a new impetus.

Varieties of black raspberries are readily propagated from the tips of canes, which are bent over and covered with earth, whereupon the tips take root. Tipping is done in northern latitudes about the middle or toward the end of August from young, healthy, and vigorous plants. Cheapness of young plants, because of ease of propagation, is a strong point in favor of the black raspberry.

Purple Raspberries

Purple raspberries are hybrids between native red raspberries and black raspberries, occurring both naturally and under cultivation. Therefore these purple varieties, of which some twenty or thirty have been under cultivation, need not be grouped in a distinct species, as they long have been under the name *R. neglectus,* Peck; for, like other hybrid plants, they are a most variable race, their offspring sometimes being so nearly like one or the other parent as to be indistinguishable, and at other times being intermediates—quite too inconstant and mutable to pass as a single species. Whether or not the European red raspberry has ever been one of the parents of these purple sorts does not appear, but almost certainly it would cross with the black raspberry as readily as does the native red. Shaffer and Columbian are now the most prominent representatives of the purple sorts. These hybrid plants propagate either by tips or suckers, the former being the most common method.

While exceedingly variable, sometimes resembling the black and sometimes the red parent, the purple varieties selected for cultivation have fairly well-marked characteristics. The plants are more vigorous and more productive than those of either parent; the fruit-clusters contain more berries and are more open and straggling; the berries are larger and juicier and range in color from yellow to red and dark purple. While the named varieties of purple raspberries may usually be distinguished as belonging to this group by the marks given, not all are so characterized; for example, Philadelphia, almost certainly a hybrid, and its numerous seedlings, are much more like the red than the typical purple plant, and the berries are very like red raspberries only of a darker color.

The purple raspberries have been cultivated since 1835, in which year the Philadelphia was found wild near Philadelphia, Pennsylvania. Shaffer, still one of the good commercial purple sorts, was found near Scottsville, New York, in 1871. This type of raspberry has recently received a great impetus through the development of the canning industry, for the purple varieties are preëminently the best raspberries for canning, jams, and conserves.

Oriental Raspberries

China and Japan are now prolific sources of profitable horticultural plants, not the least of which are several interesting raspberries. These, although long known, acquire new and greater interest because of the possibility of hybridizing them with other brambles. The possibilities of hybridization have been made more apparent by the recent development in knowledge of the laws of hybridization, and by the introduction of several remarkable bramble hybrids.

Wineberry. Fig. 237.

The wineberry of the Orient, *R. phœnicolasius,* Maxim, a native of the mountains of China and Japan, is an interesting ornamental and food-plant introduced into America as the Japanese wineberry in 1889. It is a bushy bramble, attaining a height of six feet, the canes long, recurving, spreading, rambling, and covered with bright reddish-brown, glandular hairs and weak prickles, which give it a characteristic appearance. The flowers are white, very small, and are borne in dense, hairy clusters, which in their turn spring from a large, loose, leafy panicle. The bristly and viscous calyx-lobes envelop the growing fruits, keeping them covered until they ripen, after which the calyx opens, showing a small, soft, insipid, whitish raspberry, that quickly be-

comes cherry-red, The flavor is somewhat intermediate between that of the red and that of the black raspberries, but rather mawkish for most palates. Unfortunately, the canes are tender to cold and die down in the winters of the northern United States. The plants also are too unproductive for a commercial raspberry. The berries are handsome and, owing to their covering, suffer but little from insects and fungi. The wineberry is hardly worth growing for fruit, but is a handsome ornamental and may prove desirable as a parent in the production of hybrid brambles.

237. Wineberry. (×½)

Strawberry-raspberry.

Another novelty among the many edible raspberries from the Orient is the strawberry-raspberry, *R. illecebrosus,* Focke. This plant has for many years been grown in greenhouses for its flowers, but was reintroduced from Japan a few years ago for its fruits. The berries are so sour and bitter as to be almost unpalatable to eat out of hand, but when cooked the flavor is pleasant, reminding one of a mixture of strawberries and raspberries. The cooked product is a handsome garnet-red quite suitable for coloring sirup. In northern United States, the plant is herbaceous, freezing to the ground each winter, but throwing up a mat of bright-colored plants each spring. The plant is a dwarf, prickly, glabrous, semi-herbaceous bramble with brightly colored pinnate leaves and large, white, sweet-scented flowers. The berries are bright scarlet, borne singly or in clusters of two or three, and almost continuously throughout the season. The mat of plants is so dense that weeds are smothered. With its continuous bloom and fruit, the strawberry-raspberry is a most attractive ornamental, with some value for its edible fruits. *R. rosæfolius,* Smith, is so similar as to pass under the same common name.

Mayberry.

Under the name Japanese Golden mayberry, a hybrid between the Cuthbert red raspberry and *R. palmatus,* Thunb. was introduced by Luther Burbank. The plant is described as attaining a height of six to eight feet, and as bearing many large white blossoms which are followed by large, sweet, glossy, golden semi-transparent berries, ripening in advance of the strawberry. Introduced some years ago, the mayberry seems not to have grown in favor, as it is now seldom to be found.

Golden Evergreen raspberry.

This is a yellow-fruited species, *R. ellipticus,* Smith, from the Himalayas. It is a tall, upright plant, densely beset with reddish-brown hairs, bearing yellow fruits the size of the common raspberry, which are said to be of very good quality. The species belongs in the far south, being naturalized in Jamaica, and is said to be the only raspberry under cultivation in southern Florida. It is a handsome ornamental, recommended as a good covering for pergolas in southern climates.

Some ten or twelve other known species of raspberries from eastern and central Asia produce edible fruits. Undoubtedly others will be discovered and from time to time introduced for cultivation or for hybridization with raspberries now under cultivation.

Little-known American Raspberries

Several American raspberries other than the major species already discussed produce edible fruits, and may be found under cultivation as ornamentals or for their fruits. Hybridizers are making use of all of them with the hope of increasing their value as food-producing plants.

Cloudberry.

One of the fruits of high northern and arctic regions, but reaching as far south as the northern states of the Union, is *R. Chamæmorus,* Linn., which passes under various common names; as, cloudberry, bakeberry, yellow berry, salmonberry, and molka. It is an herbaceous, creeping plant, bearing large white flowers in solitary terminal peduncles. The fruits are composed of a few large globular drupelets, red or yellow, and are much prized as a food by the inhabitants of northern regions and are gathered in large quantities. The cloudberry can be grown in the northern states in peat-bogs, cool places, and rock-gardens.

Arctic Raspberry.

The Arctic raspberry, *R. articus,* Linn., grows in the same range as the cloudberry, and produces edible berries, which, however, are hardly so desirable as those of the cloudberry.

Rocky Mountain flowering raspberry.

Although not highly esteemed for its edible fruits, this raspberry, *R. deliciosus,* James, of the mountains of Colorado, is so deserving to be known as an ornamental that it is included among hardy fruits. The plant is a compact, bushy bramble reaching a height of five feet, and bearing, on mostly single-flowered peduncles, large pure white flowers in great profusion in early summer and throughout the season. The berry is hemispherical, purple or wine-colored, with large, soft drupelets similar to those of the red raspberry. The plants are hardy, but, unfortunately, are rather difficult to propagate. Whether or not this species will hybridize with any of the cultivated brambles seems not to be known.

Flowering raspberry.

The flowering raspberry of the East, *R. odoratus,* Linn., differs from the Rocky Mountain flowering raspberry in aspect of plant; in bearing rose-purple flowers in the place of the white flowers of the former; in that the peduncles bear several flowers instead of but one; and the fruits are broader, flatter and a lighter red. The species grows wild from Nova Scotia westward to Michigan and southward to Alabama. While its habitat is rich shady woods and rock banks, it thrives under cultivation, making a handsome ornamental and producing handsome, pleasant-tasting berries. Unlike the western flowering raspberry, it is not difficult to propagate, as it spreads rapidly from the roots. This species has been hybridized with the red raspberry on the grounds of the New York Agricultural Experimental Station, but the offspring are sterile.

Rocky Mountain thimbleberry.

The western representative of *R. odoratus* is *R. parviflorus,* Nutt, often erroneously called the salmonberry. This western form differs from the eastern species in bearing pure white flowers in few-flowered clusters. It is found wild from northern Michigan to the Pacific Coast and southward in the Rocky Mountains. It has the same pomological possibilities as the preceding species, although the fruits are rather better flavored, and are more commonly harvested from wild plants.

Salmonberry.

This species, *R. spectabilis,* Pursh, is a vigorous-growing bramble, reaching a height of ten or twelve feet, and bearing showy red or purple flowers one to two inches in diameter. The fruits are large, salmon-color or wine-red, conical, and very pleasant for dessert. Its habitat is from California to Alaska, but it thrives in England, and would probably do so in many parts of eastern United States. The salmonberry is easily propagated from suckers; in fact, often becomes a pest on the Pacific slope. While the fruits are large, handsome, and pleasant to eat, they are not borne abundantly enough to promise much as a food plant, but possibly the species can be hybridized with a more productive bramble.

NATIVE BLACKBERRIES

The common garden blackberries are all derived from several native species, except two quite distinct varieties, the Oregon Evergreen and the Himalaya, as yet comparatively little known in commercial plantations, which are progeny of Old World species. As they were but recently domesticated, the number of varieties is not great, but, even so, because of great variability, they are classified with difficulty. There is an almost endless variety of wild blackberries, out of which botanists have made many species, and have variously defined the few species-types that have been given general recognition. Species cross and recross in the wild and in the garden. With present knowledge of Rubus, it is almost impossible to classify varieties with reference to the species from which they came; therefore, in a pomological work, it is needless to describe the many species that are now represented in cultivated blackberries. It is best to attempt only a brief characterization of well-recognized species-types from which pomological blackberries are derived.

According to Bailey (*Stan. Cyc. of Hort.,* p. 3031. 1916), who has given much study to pomological blackberries, the following species form the foundation of the flora of cultivated American blackberries.

1. *Rubus argutus,* Link. The prevailing group of wild blackberries in eastern America is represented by *R. argutus* which is widely distributed from Canada to North Carolina and westward to Iowa. Probably the greatest number of cultivated varieties came from this species, with which, however, are associated some four or five other species from which cultivated offspring have come. The plant is erect and stout with very prickly stiff stems; leaves small or medium-sized, with short-pointed leaflets, the ribs and petioles thorny; flower-clusters short and usually free from glands.

2. *Rubus floridus,* Tratt. This is a taller growing blackberry than the former, with branches decumbent or recurving and beset with stout curved prickles; leaflets mostly narrow and acuminate and more or less pubescent beneath; the flower-clusters are loose and leafy with few flowers; the fruits are elongated, with small drupelets.

The habitat is from Virginia southward and westward. Two other species are probably associated with *R. floridus.*

3. *Rubus frondosus,* Bigel. The plants of this species are of but medium height, with canes erect or arched-recurving, and with stout, straight or slightly curved prickles; the leaflets are broad, becoming glabrous above, velvety-pubescent beneath; flower-clusters cylindrical, elongated, provided for more than half their length with ovate-oblong, petiolate, very persistent bracts; pedicels scarcely or not at all glandular; fruits subglobose, falling before the bracts and with rather few drupelets.

PLATE XIII.—AGAWAM BLACKBERRY.

The habitat of *R. frondosus* is from Canada to Virginia and westward to Kansas. At least five other species are given by Bailey as associated with this one.

4. *Rubus allegheniensis,* Porter. This is a mountain blackberry of medium height or tall, but more or less recurving, with the old canes purplish and armed with stout, slightly curved prickles; the leaflets are ovate, often glandular, pubescent beneath; flower-clusters mostly elongated but not leafy; fruit generally subcylindric, rather small, with many small drupelets, and of very good flavor.

White blackberries, usually amber-colored fruits, while occasionally occurring in other species, most often belong to *R. allegheniensis.* The habitat is from Canada to North Carolina and westward to Illinois. A sport of this species with dry, abortive fruits is not uncommon. Bailey names three other species as usually associated with this blackberry.

5. *Rubus canadensis,* Linn. This is another mountain form easily distinguished by its tall, rather weak, usually thornless canes which are erect or recurving; the leaflets are thin, glabrous on both surfaces, and finely, evenly and sharply toothed; the flower-clusters are rather long, cylindric, leafy-bracted at the base; the fruits are subglobose to short-cylindric and composed of large, juicy, somewhat acid drupelets.

The species is a native of Canada and the northern states southward in the high lands to North Carolina. Bailey says that this species is apparently not represented in domestication, the so-called thornless forms being unarmed offshoots of normally thorny blackberries; a robust form, however, from the mountains of West Virginia, which in botanical characters scarcely differs from this species, and is included with it by most botanists, by others put in a separate species, *R. Millspaughii,* Brit., is, on the grounds of the New York Agricultural Experiment Station, a most promising subject for domestication, and should receive the attention of pomologists.

EUROPEAN BLACKBERRIES

The three following species are exotics of little commercial importance in America; all, however, have been widely advertised, and, while probably never to become important as garden blackberries, are likely to be permanently represented in America. All are quite distinct from native blackberries, because of their perennial canes, and flowers usually borne on terminal shoots.

6. *Rubus thyrsanthus,* Focke. Canes vigorous, suberect or decumbent or prostrate when very long, angled and grooved, thorny with flattened, declined or curved prickles, mostly thinly hairy or pubescent; petioles and midribs recurved, prickly; leaflets 3-5, thick, green above and white-tomentose beneath, sharply and mostly serrate-dentate; flower-clusters thrysoid-paniculate, narrow, short or elongated, sometimes compound, pubescent or tomentose, leafy; fruit black.

The species is an inhabitant of central Europe, although much scattered by cultivation. According to Bailey, from whom the above description is taken, the Himalaya blackberry, now much advertised and very generally distributed in the United States, is probably referable to this species. If this is the case, it is also the parent of two interesting hybrids with Kittatinny, a native blackberry, made by J. M. Mack, Fallbrook, California, plants of which have been distributed by the United States Department of Agriculture.

7. *Rubus Linkianus,* Ser. Canes angled and beset with many very strong and sharp hooked prickles, finely pubescent; petioles and midribs strongly prickly; leaflets 3-5, oval or elliptic and acute, strongly and doubly toothed, green and glabrous above, white-tomentose beneath; flower-clusters short-paniculate, beset with strong prickles, more or less leafy, pubescent or tomentose; flowers mostly double, white; fruit black.

The wild plant and the native country are unknown, the species being founded on garden specimens. Bailey, in the discussion of this species, says that a similar plant, not double-flowered, occurs apparently as a wild plant from Maryland to Florida, from which the tree blackberry or Topsy, introduced some years ago for its fruit, seems to have come. The sand blackberry, *R. cuneifolius,* Pursh, growing in dry fields from Florida to Louisiana, according to Bailey, has been confused with this species.

8. *Rubus laciniatus,* Willd. Cut-leaved Blackberry. Evergreen Blackberry. Oregon Evergreen Blackberry. Plants vigorous, trailing, half-hardy, very productive; canes long, the lower part perennial and becoming 2 or 3 inches in diameter, dark red, few branches, with long, stout, somewhat recurved prickles. Leaflets 3, broad-ovate, divided into several linear, sharply toothed divisions, ribs and petiole prickly, evergreen in mild climates. Flowers in terminal panicles, 1⅛ inches in diameter, light pink or white, 8 to 10 inches long, open, leafy, prickly clusters. Fruit late, ripening over a long season, medium in size or small, black, of indifferent quality.

This blackberry is without doubt a native of Europe, but whether a distinct species or a cut-leaved form of another species is not determined. It seems to have been widely scattered at least as long as a century ago, and it is now a run-wild in several islands in the Pacific Ocean and on the Pacific slope of North America. It is grown for its fruit and as an ornamental in the regions named, but does not thrive in colder climates and nowhere has great value as a commercial variety. Its very late and long season gives it importance for home plantations. The plants are deep rooted, hence probably more resistant to drouth than any other blackberry. The plants root at the tips, the chief method used in propagating. The canes are so heavily armed with thorns that picking is a most unpleasant task.

A variety grown more or less in New Jersey, variously known as Diamond, Black Diamond, Star, Wonder, Ewing Wonder, and Atlantic Dewberry, is probably a seedling of Oregon Evergreen.

DEWBERRIES

A dewberry is a trailing blackberry. Dewberries ripen earlier than blackberries and they are further separated by the flower- and fruit-clusters. In true dewberries, the center flowers open first and the flowers are few and

scattered; in the true blackberries, the lower and outer flowers open first and the clusters are dense. This distinction in flower-clusters does not always hold, and there are also hybrids between the two in which these characters are confused. A further distinction is found in the method of propagation. Dewberries, in nature or under cultivation, are propagated from tips, while blackberries naturally propagate themselves from suckers, and under cultivation are propagated from suckers or from root-cuttings. In the matter of propagation, also, there are exceptions, as the Evergreen and Himalaya blackberries, and several hybrids between the blackberries and dewberries are propagated from tips. There are many intermediate forms, making it difficult to separate the two fruits.

Dewberries are American fruits but recently domesticated, for their cultivation as a commercial crop did not begin until toward the close of the nineteenth century, although named varieties go back to the middle of the century. It is hardly correct to speak of them as domesticated plants, for many of the varieties have been brought to the gardens from woods and fields, and in the garden they behave more like wild than domesticated subjects—the most uncertain and unmanageable of all small-fruits. However, the dewberry is a most important addition to pomology, as the fruits ripen earlier, and are larger, handsomer, and better flavored than blackberries, while the plants are usually more productive. When hardier varieties have been selected, which at the same time are less capricious to soils and less dependent on cross-pollination between varieties, the place of dewberries in home and commercial plantations will be established. At present, several species and a rapidly increasing number of varieties are under cultivation.

Of the many species of blackberries and dewberries, from which cultivated varieties are certainly derived, pomologists distinguish four as dewberries.

1. *Rubus procumbens,* Muhl. This species is characterized by woody canes several feet long, becoming prostrate, usually stoutly armed with recurved prickles; leaflets usually narrowed at the base, nearly or quite glabrous, membranaceous; flowers in leafy racemes; fruit subglobose to short-cylindric with few to many large juicy drupelets.

This is the dewberry of dry open fields from Maine westward and southward. Var. *roribaccus,* Bailey, is a well-marked subspecies from West Virginia, of which the plant is stronger, the flowers larger, with more elongated pedicels and with larger fruits. There are several cultivated varieties of the subspecies, of which the old and well-known Lucretia is the best representative. *R. procumbens* is the most important type of dewberry in cultivation.

2. *Rubus invisus,* Brit. This species is similar to the last and seems to have about the same range. The canes are stouter, less procumbent, often making mounds or piles of canes and herbage, not so well armed; leaves more coarsely toothed; pedicels longer, and with large and leaf-like sepals. Several cultivated dewberries are derived from this species of which Bartel is best known and most representative.

3. *Rubus trivialis,* Michx. Southern Dewberry. This species is quite distinct from 1 and 2 and so variable as to be most perplexing to systematists. Canes very long, usually wholly trailing, slender, armed, as are also the petioles and often the peduncles, with flattish, short, hooked prickles; leaflets leathery, of three kinds, those on fruiting shoots rather small and nearly or quite evergreen; peduncles 1-3 flowered; fruit cylindrical with many drupelets which are sometimes dry and seedy but usually juicy and excellent.

The habitat is from Virginia to Florida and Texas near the coast. Of the few varieties of this species under cultivation, Manatee is probably the oldest and best known. This is the common dewberry or running blackberry of the southern states, which often becomes a pest, sometimes as an escape from cultivation.

4. *Rubus vitifolius,* Cham. & Schlecht. Western Dewberry. California Dewberry. This species is characterized by trailing, sometimes erect, slender, pubescent canes with straight or recurved slender prickles; 3-5 evergreen leaflets, about 2 inches long, ovate, doubly serrate, exceedingly variable; flowers often imperfect, the petals of staminate flowers longer than those of the pistillate ones; fruit black, red in the loganberry, oblong, of medium size, sweet and pleasant; the drupelets more or less pubescent. By some the species is separated into two because of variableness in the amount of pubescence on stems and leaves and in the size and shape of the fruit.

The western dewberry is an inhabitant of California along streams and in moist places. Of the several cultivated varieties belonging to the species, Aughinbaugh and Skagit Chief were long best known, but recent investigations show that the widely cultivated loganberry, long considered a hybrid between this species and the European red raspberry, is a cultivated form of this species. Laxton, Mahdi, Mammoth (Lowberry of some), Phenomenal, and Primus are all hybrids with or pure-bred varieties from the western dewberry, which by virtue of these valuable offspring becomes a species of prime importance to pomologists.

CHAPTER XVI

VARIETIES OF RASPBERRIES

Varieties of raspberries known to have been grown in America run into the hundreds, but the number now to be found in the nurseries of the country is surprisingly small. About 50 red, 5 purple, and 30 black sorts are offered in the catalogs of 1920, some of which in each group are barely mentioned. These numbers do not include a few sorts put out by experimenters under number, or newly named, for trial. In this text the varieties are arranged in two groups, the red and hybrid varieties in one, and the black raspberries in another group. It is now impossible to separate the red and hybrid, or purple varieties, the types having become hopelessly confused. Neither is it necessary to put the varieties of Old World and New World red raspberries in separate groups.

Despite the small number of varieties of raspberries now under cultivation, the popularity of this fruit is not on the wane; on the contrary, the acreage is steadily increasing in proportion to the population. The decrease in number of varieties is due to greater and greater specialization on varieties preeminently meritorious for berry regions or for distinct purposes. Possibly no field of pomology offers greater opportunities in plant improvement than the brambles, and another reason for the small number of raspberries is that old sorts are being rapidly discarded for much better new ones. The march of progress in the introduction of varieties is so rapid that, without question, there will be a new list of cultivated brambles every few years.

RED AND HYBRID RASPBERRIES

ANTWERP. *R. idæus. Red Antwerp.* Antwerp is one of the oldest European varieties supposed to have come from the Island of Malta to Antwerp, Belgium. Nevertheless, it is still one of the best of its kind, and is more or less grown in various parts of America. Antwerp is a favorite on the Pacific slope, where it is often planted as a companion of Cuthbert, than which it is more productive. It is tender to cold and susceptible to crown-gall.

Plants vigorous with long yellowish-green canes, glaucous, tinged with purple; beset with dark brown bristles; bearing wood nearly smooth. Fruit early, large, conical, dark red, firm, rich and rather sweet; quality good.

BRANDYWINE. *R. strigosus. Susqueco. Wilmington.* This is one of the oldest native red raspberries, now discarded because of the weak and unproductive plants and rather small berries. The origin of the variety is unknown, but it was to be found in the markets of Wilmington, New Jersey, in the middle of the last century.

Plants erect, rather weak, tender to cold, unproductive. Fruit early midseason, hemispherical, small, rich scarlet; flesh firm, juicy, rather insipid; quality fair.

BRILLIANT. *R. strigosus.* This variety is comparatively new, and is grown commercially only in New Jersey and Delaware, where it has the reputation of being one of the most profitable red raspberries. It is a heavy yielder and is adapted to a variety of soils, which, however, must be rich. At Geneva, New York, the plants are not sufficiently hardy for a commercial variety. Brilliant originated at Bridgeville, Delaware, and was introduced in 1901.

Plants medium to tall, of medium vigor, upright or slightly drooping, much branched, very productive, with many suckers, lacking in hardiness. Leaflets rather small, yellowish-green, with characteristic tendency to lobe. Fruit early midseason, just before Cuthbert, rather small, hemispherical, downy, light bright glossy red; drupelets of medium size, rather dry, mild and not particularly well flavored; quality not above good; seeds of medium size.

CARDINAL. *R. strigosus* × *R. occidentalis.* The preëminent merit of Cardinal is its adaptability to climate—it can be grown farther north and farther south than any other purple sort, and farther south than any other raspberry. The plants are very productive, vigorous and healthy, and yet Cardinal is not as much prized as Columbian and Shaffer in places where the three may be grown. It is a valuable sort for the Central West. The variety originated with A. H. Griesa, Lawrence, Kansas, in 1895, and was introduced in 1898.

Plants vigorous, very hardy to heat and cold, productive. Fruits large, uniform in size, broadly-hemispherical, rather dark purple, dull; drupelets large, round, numerous; torus large, smooth, releasing the berry readily; flesh juicy, firm but tender, sweet, rich, aromatic, resembling in flavor the red raspberry; quality good to very good; seeds rather large.

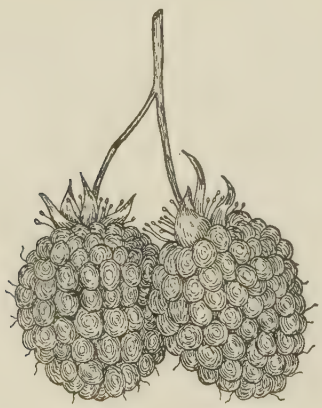
CAROLINE. *R. idæus* × *P. occidentalis.* At one time an almost universal favorite because of berries of excellent flavor and long season of ripening, Caroline is now all but a lost variety. The peculiar salmon-color of the fruits attracts attention. The long season and the softness of the flesh kept the variety from becoming a commercial berry. Caroline originated about 1865 with S. P. Carpenter, at New Rochelle, New York, and is supposed to be a hybrid between Orange, a European red,

and Golden Cap, a seedling of an American black raspberry. It may be propagated either by suckers or tips.

Plants vigorous, hardy, healthy, productive, with light-colored, upright canes having very few prickles. Leaves very dark green. Fruit of medium size, orange-pink deepening to salmon color; flesh soft, juicy, sweet but sprightly; quality excellent.

COLUMBIAN. *R. strigosus* × *R. occidentalis.* Columbian is the most prized of the purple raspberries. It takes leading place by virtue of the large size, firm flesh, handsome appearance, and high quality of the fruit; and the hardiness, healthfulness, and phenomenal productiveness of the plants. It is now more largely grown for commercial canning than any other raspberry, red, black, or purple; and, when canned, is superior to any other raspberry in appearance and flavor. Columbian is often compared with Shaffer, a much older variety. The fruit of Columbian is smaller, firmer, and hangs on the plant longer than that of Shaffer; the plants are more vigorous and more productive, and the fruiting season is later. Shaffer excels Columbian only in greater hardiness of plant. Columbian originated from seed of Cuthbert, a red, growing next to Gregg, a blackcap; the seed was sown in the spring of 1885 by J. T. Thompson, Oneida, New York.

Plants very tall, very vigorous, very productive, lacking in hardiness, upright-spreading; canes numerous, tall and stout, round, dull reddish-brown, with numerous straggling, straight prickles. Leaflets 3, large, oval, rugose, glabrous, yellow-green above, greenish-gray and pubescent beneath. Flowers 12-16 in a long, open, leafy, prickly cluster. Fruit midseason, season long, large, broadly-round, dull purple; torus small, releasing berry easily; drupelets large, round, numerous; flesh firm, juicy, mild and sprightly, very aromatic; quality good; seeds rather large.



238. Cuthbert. (×1)

CUTHBERT. Fig. 238. *R. strigosus. Conover. Queen of the Market. Dainty Favorite.* Cuthbert is the most commonly grown red raspberry in America. The preëminent meritorious character which justifies its popularity is its freedom from local prejudices of either soil or climate. While best adapted to somewhat sandy land, Cuthbert thrives on a wide range of soils, and is as hardy to cold and endures heat as well as any other red raspberry. The plants are healthy and productive, and the crop ripens evenly over a long season. The berries are of good red color, firm of flesh, and fine in flavor,—qualities which make it suitable for home and market alike. Cuthbert originated as a chance seedling on the grounds of a Mr. Cuthbert, Riverdale-on-Hudson, New York, and was introduced in 1865.

Plants tall, vigorous, upright, medium number of suckers, hardy, not very productive; canes long, numerous, round, yellowish-brown, with a few straight prickles. Leaflets 3-5, of medium size, dull dark green, rugose, glabrous above, pubescent beneath. Fruit midseason, large, uniform, retains size well through the season, conical; color dull dark red, with light bloom; drupelets small, numerous, juicy, firm, sweet, rich; quality very good; seeds rather small.

EATON. *R. strigosus. Alton Improved. Idaho. Iowa.* In spite of several serious faults, Eaton is largely grown in New England because of unusual productiveness and hardiness. The faults are: the berries crumble badly and do not separate easily from the torus; the flavor is too acid to be pleasant; the plants droop almost to the ground, making them hard to manage; and, except in New England, there are not enough canes to make the variety productive. Eaton originated as a chance seedling with Ulysses Eaton, Cambridge City, Indiana, in 1885.

Plants medium tall, of moderate vigor, drooping, with a distinct tendency to branch, making few suckers, very hardy, productive only in New England. Fruit midseason, clings to torus and crumbles when picked, round-conical, the surface irregular and undulating, clear, bright, durable crimson; pedicel slender, beset with prickles; drupelets very large, broadly grooved; flesh red, juicy, firm; flavor rather acid with an agreeable aroma; quality good for culinary purposes only; seeds small.

EMPIRE. Fig. 239. *R. strigosus.* Empire is one of the most promising new red raspberries, having as its chief assets hardiness, productiveness, vigor of bush, healthiness, and large, handsome, firm, well-flavored fruits.

239. Empire. (×1)

The plants need no winter-protection in New York; equal any other variety in productiveness; and are unusually vigorous, reaching a

height of six or eight feet. A peculiarity of the canes is that in mid-summer they are purplish-red, but become brown at the close of the season. The berries average larger than those of the well-known Cuthbert, and are about the same color, ripen a little earlier, and have a longer picking season. The fruits are mild, rich and sweet and may be ranked among the best in quality. The texture is firm and the berries stand shipment well and may be kept long. With such an array of good characters, it seems certain that Empire must take high standing among commercial red raspberries. Empire originated in 1904 with L. E. Wardell, Marlboro, New York.

Plants tall, vigorous, upright, with medium number of suckers, hardy, very productive; canes smooth except for the few scattering, short prickles, stocky, long; prickles short, few, becoming more numerous towards the base. Leaflets large, wide, thick, dark green, rugose. Fruit early midseason, clings well to the torus yet picks easily; large, uniform, retains its size well to the close of the season, regular in outline, round-conical; bloom slight; drupelets small, numerous, with strong coherence; color medium to dark red, glossy; flesh juicy, firm, mild, high-flavored; very good in quality; seeds medium in size.

GOLDEN QUEEN. *R. strigosus.* Golden Queen is a yellow Cuthbert, of which it is probably a seedling or a sport. In plant and berry, it is almost identical with Cuthbert, except that the berries are light yellow, sometimes tinged with pink, are richer and more delicately flavored, and softer. The canes are a little paler in color and a little more suggestive of *R. idæus.* The variety was found by Ezra Stokes, Camden County, New Jersey, in 1882, in a field of Cuthberts. It thrives wherever Cuthbert thrives, and is a desirable raspberry for home use. The berries have the charm of individuality, which makes them highly prized by fruit-fanciers.

HAILSHAM. *R. idæus.* A few red raspberries fruit on the first year's wood in the late summer. These are the everbearing or autumn-fruiting varieties of the catalogs. Among the best of these is Hailsham, an English variety which is being grown somewhat in California. The variety is described as very distinct in plant and berry. The plants are vigorous, with remarkably large leaves, producing enormous, hemispherical, dark red berries of excellent quality, and bearing the main crop in autumn. Picking must not be hurried, if color and taste are to reach the condition where nothing requisite is wanting.

HAYMAKER. *R. strigosus* × *R. occidentalis.* Haymaker is a comparatively old purple raspberry now being superseded by Columbian, and, even at its best, inferior to the older Shaffer. As compared with these two varieties, the fruits are smaller, resembling a black raspberry in size and shape; more variable in color, a berry often being both light and dark purple; and inferior in flavor. Haymaker originated with A. P. Haymaker, Earlville, Ohio, about 1890.

HERBERT. Fig. 240. *R. strigosus.* Herbert is one of the best berries of its kind, yet many large berry-growers have not tried it, and few nurserymen list it. The pre-eminent merits are: great vigor and hardiness being rather hardier than the well-known Cuthbert; comparatively few suckers; and, most valuable of all, tremendous productivity, being nearly twice as productive as the old standard, Cuthbert. The season is about that

240. Herbert. (×1)

of Cuthbert, but usually continues a few days longer. The berries are somewhat similar to those of Cuthbert, but are more sprightly in flavor, a little larger, rounder, and, unfortunately, a little softer. The fruits will not hold their shape quite as well as those of some other sorts; this is the chief, if not the only, point of inferiority in the variety. The berries, however, are firm enough to carry to nearby markets with ordinary care. Herbert is a chance seedling found in the garden of R. B. Whyte, Ottawa, Ontario, about 1891.

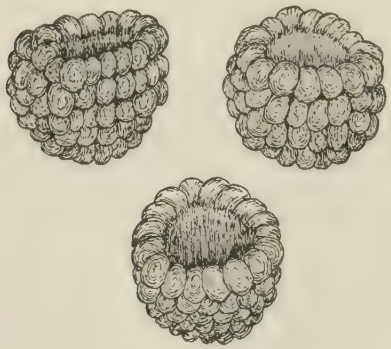
Plants vigorous but not so tall as Cuthbert, upright except when borne down by the weight of fruit, hardy, healthy, very productive; canes intermediate in size and smoothness, numerous, dull red; prickles medium in length and number. Leaflets oblong-oval, dark green, rugose. Flowers large; petals rather large, oval, tapering to short, abrupt claws. Fruit matures late, about with Cuthbert; large to very large, broadly ovate, with medium to large, coherent drupes, dark red, juicy, soft under unfavorable conditions, pleasant flavored, sprightly; good in quality.

JAPANESE GOLDEN MAYBERRY. *R. palmatus* × *R. strigosus.* This variety was described as follows in 1895 by Luther Burbank, the originator:

"The earliest raspberry known. The berries are of a golden-straw color, as large as Cuthbert, and ripen before strawberries, and before the earliest of the standard raspberries of the past have hardly awakened from their winter rest. The bushes are distinct from all others, growing like trees, 6-8 feet high, with spreading tops; and all along the branches large, white, well-shaped blossoms are pendant, which are soon followed by the great, sweet, glossy, golden, semi-translucent berries. The plants when well established, will surprise one with their abundance of fruit. The history of this variety is as follows: 'Some ten years ago I instructed my collector in Japan to hunt up the best wild raspberries, blackberries and strawberries that could be found. Several curious species were received the next season, and among them a red and also a dingy yellow, unproductive variety of *Rubus palmatus.* One of these plants, though bearing only a few of the most worthless, tasteless, dingy yellow berries I have ever seen, was selected solely on account of its unusual earliness, to

cross with Cuthbert and other well-known raspberries. Among the seedlings raised from this plant was this one, and though no signs of the Cuthbert appear, yet it can hardly be doubted that Cuthbert pollen has effected some of the wonderful improvements to be seen in this new variety.' "

JUNE. Fig. 241. *R. strigosus.* Several remarkable characteristics of plant and fruit make June worthy of extensive planting. The plants are as hardy and as healthy as those of its two well-known parents, Loudon and Marlboro, and are more vigorous. Comparatively few suckers are produced, and these are little crowded, so that the plants are better able to mature their crop. The yield is heavy and is well distributed over a long season, which begins the earliest of all of the 70 varieties of red raspberries growing at the New York Agricultural Experiment Station, Geneva, New York. It ripens as no other raspberry does, in June, hence the name. The fruits resemble those of Loudon in color, but



241. June. (×1)

are a brighter, handsomer red; they average larger and are more spherical. The product ships unusually well throughout the season, and is high in quality. June is the result of a cross made on the New York Station grounds in 1897 between Loudon and Marlboro.

Plants vigorous, upright, few suckers, hardy, very productive, healthy; canes stocky, nearly smooth, roundish, often with considerable bloom; spines straight, short, few in number and distributed almost entirely near the base. Fruit matures very early, keeps and ships well, adheres well to the bushes, easily picked; berries very large, and holding their size unusually well until the close of the fruiting season, firm, with large drupelets, bright, handsome red resembling Loudon, mild subacid; quality very good.

KING. *R. strigosus.* In the Northeast, King, although hardy, is not so satisfactory as other standard sorts, but in West Virginia and westward through the Central West it is considered one of the best early red raspberries. King is one of the standard sorts in Minnesota. It is most productive on clay loams. King was grown from seed by T. Thompson, Richmond, Virginia, and was introduced in 1892.

Plants tall, vigorous, upright-spreading, productive, hardy; suckers numerous. Leaflets rather small, somewhat lanceolate, more or less pubescent on both surfaces. Flower-cluster long, loose, leafy, with 8-12 flowers. Fruit early, of medium size, light red; receptacle small, releasing the berry easily; drupelets rather small, cohering poorly, the berries crumbling rather badly; flesh soft, tender, with rather insipid flavor; quality rather poor; seeds of medium size.

LOUDON. Fig. 242. *R. strigosus.* Long a dependable variety, Loudon is still one of the best red raspberries for the northern limits of this fruit, being hardier than Cuthbert or

242. Loudon. (×1)

Marlboro, with which it must compete in raspberry regions. The product is liked by canners, because it holds its color well. The fruits are not so good in quality as those of Cuthbert, and the plant is very subject to crown-gall or "knotty roots". Loudon is supposed to be a seedling of Turner crossed with Cuthbert, and originated about 1890 with F. W. Loudon, Janesville, Wisconsin.

Plants of medium height and vigor, stocky, upright, very hardy; with numerous canes. Fruit midseason, bright red, medium to large, somewhat larger than Cuthbert, conic; drupelets large with a well-marked suture, adhering so that berries do not crumble; receptacle of medium size, releasing the berry easily; flesh firm, tender, juicy, moderately sweet, pleasantly aromatic; quality good; seeds relatively small.

MARLBORO. Fig. 243. *R. strigosus.* Grown more or less in all the berry regions of North America, Marlboro is the standard early red raspberry in many parts of the East,

243. Marlboro. (×1)

along the shores of Lake Erie, and in Colorado. In these regions the variety is prized for hardiness; productiveness; its very large berries, which average three-fourths of an inch, and are often more than an inch in diameter; its handsome crimson fruits; and because the crop hangs on the bushes three or four days after maturity and is still marketable. Marlboro originated with A. J. Caywood, Marlboro, New York, in 1882.

Plants of medium height and vigor, upright, hardy, very productive, with numerous canes. Foliage rather

sparse on old canes and of a characteristic greenish-yellow color. Flowers early, large, 6-10 in a rather short, leafy, compact cluster. Fruit early, large, regular, dark but bright red, conical, downy; drupelets irregular, numerous, adhering well so that berries do not crumble; receptacle smooth, releasing the berry easily; flesh firm, tender, juicy, mild and rather poor in flavor; quality not above good; seeds small.

MILLER. *R. strigosus. Miller's Woodland.* This is an old variety which was at one time very popular in Delaware, and is still grown there in small quantities. The origin was the same as that of the better-known Brandywine, which it greatly resembles, differing chiefly in earlier ripening of the fruit. Miller is being discarded because the plants lack vigor and are only moderately productive. It seems never to have been widely distributed.

OHTA. *R. strigosus* × ? Ohta is a promising new variety for the austere climate of the northern part of the Great Plains. On the grounds of the State Experiment Station, Geneva, New York, the fruits are too small and quite too tart to compete with June, Marlboro, Cuthbert, and their kind. Ohta is from a field of hybrid raspberries grown by Professor N. E. Hansen, of the South Dakota Experiment Station, Brookings, South Dakota. The plant was first noted in 1906, and the variety was distributed in 1912.

Plants hardy in South Dakota without winter protection, tall, vigorous, upright, productive; canes numerous, rough with a tendency to peel, reddish-brown, with numerous slender spines. Terminal leaflet often lobed and tinted with red. Flowers 5-8 in a loose, leafy, prickly raceme. Fruit late midseason, hemispherical, of only average size, light red with slight bloom; drupelets small, cohering; receptacle smooth, releasing fruit easily; flesh soft, tender, tart; quality fair to good; seeds small.

ONTARIO. *R. strigosus.* Ontario has much to recommend it for commercial plantations to precede Cuthbert and to follow Marlboro, Perfection, and June. It is one of the most productive varieties ever grown on the grounds of the New York Agricultural Experiment Station, and the berries are so large, handsome, and well-flavored, and keep and ship so well, that it is certain to be a good commercial fruit. It was grown from seed at the New York Station, Geneva, New York, first fruiting in 1911, and was introduced in 1919.

Plants medium to tall, very vigorous, upright-spreading, very productive; canes numerous, stocky, reddish-brown, almost devoid of prickles. Fruit early midseason, very large, uniform and retaining size throughout the season, broad-conic, medium red; torus small, smooth, releasing berries readily; drupelets large, adhering so that there is no crumbling; flesh firm, juicy, mild subacid, pleasantly aromatic; quality very good; seeds small.

PERFECTION. *R. strigosus.* There are two Perfection red raspberries; one from Wisconsin, which is now grown little or not at all; the other, a comparatively new variety from the great small-fruit district of the Hudson River Valley. The latter is the subject of this sketch. This variety, for the last few years, has been the best-liked sort in eastern New York because of great vigor, productiveness, and hardiness. Some find the fruit a little soft and inclined to crumble. Perfection originated with A. H. Grefe, Marlboro, New York, in 1900 and was distributed in 1910.

Plants tall, vigorous, upright, very hardy and productive; canes numerous, stocky, prickly, dull greenish-brown. Leaves on bearing wood very small, midrib spiny with a few glands at the base. Flowers 4-8 in a short, open, leafy, prickly cluster. Fruit early midseason, large, regular, hemispherical, dull, rather dark red; torus large, rather rough, clinging a little too tenaciously to the fruit; drupelets large, irregular, cohering weakly so that the berries crumble; flesh a little soft, tender, sprightly, fair to good; quality not above mediocre; seeds small.

RANERE. Fig. 244. *R. strigosus. St. Regis.* Introduced as an everbearing red raspberry, Ranere is chiefly valuable for spring-bearing, five-sixths of the crop being borne in early summer and the rest in the autumn. Aside from its being a double-cropper, there is not much to recommend the variety. The

244. Ranere. (×1)

berries, while handsomely colored, are variable in size, running rather small, and mediocre in quality. The plants are hardy, but only moderately vigorous, and very susceptible to crown-gall. The variety was long grown in New Jersey by a colony of Italians, and was generally distributed about 1912.

Plants of medium size, vigor and productiveness, hardy; canes numerous, slender, brownish-gray. Leaves rugose, glabrous above, pubescent beneath with a spiny midrib which is glandular at its base. Flowers 5-6 in a long, open, leafy cluster. Fruit early summer and autumn, rather small and variable in size, light red, hemispherical; drupelets of medium size, round, cohering poorly, the berries often crumbling; flesh rather soft, mild and insipid; quality poor; seeds small.

RED ROSE. *R. strigosus.* Red Rose is said to be a cross between Cuthbert and Loudon, but it resembles the latter so much that it is hardly worth keeping the two distinct, although its season is more nearly that of Cuthbert. The plant is very hardy, vigorous, and healthy, in particular being quite free from crown-gall. The berries are large, bright red, very attractive, but crumble too readily for a commercial berry, and are not of more than average quality. The variety originated about 1906, and was introduced in 1910. It is worth trying only where the Loudon is grown.

ROYAL PURPLE. *R. strigosus* × *R. occidentalis.* While the berries are not so inviting in either appearance or taste as those of the standard Columbian, Royal Purple may have a place in commercial berry-growing because of the great hardiness of the plants and the

lateness of the ripening period. The crop ripens one to two weeks later than that of Columbian, and has a remarkably long season, lasting until early blackberries are ripe. The variety originated with G. H. Giston, about 1898, at Bristol, Indiana.

Plant vigorous, upright-spreading, very productive, very hardy; canes of medium length, numerous, dark reddish-brown, with few thorns mostly at the base. Leaflets 3-5; very dark green above, light green and pubescent with spiny midribs below. Flowers 8-10 in short, open, leafy, prickly clusters. Fruit late, medium in size, broad-ovate, dull purple; drupelets small, numerous, round; flesh rather dry, firm, subacid, insipid; quality rather poor; seeds small.

RUBY. *R. strigosus.* Ruby is a rather unimportant seedling of Marlboro, which it resembles so closely as not to need a separate description. The plants are smaller and less productive than those of Marlboro, and the berries are smaller and not so attractive in appearance, although just as high in quality and a little less liable to crumble. The variety is grown only in the Hudson River Valley and in New England. It originated with L. E. Wardell, Marlboro, New York, and was introduced in 1903.

SHAFFER. *R. strigosus* × *R. occidentalis. Shaffer's Colossal.* Shaffer is the oldest standard purple raspberry, and was for many years the most prized. It is now being superseded by Columbian, which resembles but surpasses it, as noted in the discussion of that variety. It is still grown for canning in berry-canning regions. The propagation of Shaffer is mostly by tips, as it does not sucker well. The plants lack hardiness. The variety originated with George Shaffer, Scottsville, New York, about 1871.

Plants tall, very vigorous, very productive, lacking in hardiness; canes long, numerous, reddish-brown, with numerous stray prickles. Leaflets 3, rugose, glabrous and dark green above, gray-green and pubescent beneath. Flowers 12-14 in long, open, leafy, prickly clusters. Fruit late, large, dull purple, broadly hemispherical; drupelets large, numerous, round; flesh juicy, rather soft, sprightly, aromatic; quality good; seeds small.

SUNBEAM. *R. strigosus* ×. Sunbeam is a new and very hardy red raspberry which originated with Professor N. E. Hansen of the South Dakota Experiment Station, Brookings, South Dakota. It is considered very promising for the northern Great Plains region, where great hardiness and capacity to withstand summer drouth are required. The variety was introduced in 1913.

Plants tall, vigorous, upright-spreading, productive; canes very numerous, dull reddish-brown, with many sharp, slender prickles. Leaflets glabrous above, pubescent beneath, terminal one lobed. Flowers 5-8 in short, open clusters with slender red prickles. Fruit late midseason, below the average in size, variable, hemispherical, dark red; drupelets of medium size, cohering well; flesh soft, too acid except for culinary purposes; quality fair; seeds small.

SUPERLATIVE. *R. idæus.* Superlative is an old English variety, now grown wherever the red raspberry is cultivated, and regarded as a standard. Unfortunately the canes are not sufficiently hardy, vigorous, or productive for the eastern United States, but the variety is highly prized on the Pacific slope, especially near San Francisco. It was introduced in England in 1888, and was soon after brought to America.

Plants rather dwarf, not very vigorous, productive only in certain localities, tender to cold; canes slender, numerous; typical of *R. idæus* in leaf and flower. Fruit medium early, large to very large, conical, dark red, too dull to be attractive; drupelets large, round, cohering so that the berry does not crumble; torus small, rough and adhering too tenaciously to the berry; flesh soft, juicy, rich, sprightly, pleasantly aromatic; quality good to best; seeds relatively small.

SURPRISE. *R. idæus. Early Surprise. California Surprise.* This seems to be a most remarkable red raspberry, which, so far as yet tested, thrives only in California, where it is becoming the most popular variety of this fruit. On the grounds of the New York Agricultural Experiment Station, Geneva, New York, the plants are so tender to cold and suffer so much from dry and hot weather that the variety is worthless. In California, the fruit is described as being very like that of Superlative, but the plant is very different. Thus, the plant has the remarkable quality of bearing fruit every month in the year in southern California; bears the first season set; is bushy and almost weeping; and is reported to be much more productive than that of Superlative. Surprise originated with D. W. Coolidge, Pasadena, California, about 1898, and was introduced in 1904.

SYRACUSE. *R. idæus.* This is a typical European red raspberry; the fruits differing little from those of Superlative, and the vines have the same general appearance. Where tried in the East, the plants are not sufficiently hardy, although hardier than other varieties of foreign descent, and lack in vigor and productiveness. Syracuse is, however, an excellent sort for the home garden. It originated as a chance seedling in a garden at Syracuse, New York, about 1900, and was distributed by Green's Nursery Co., Rochester, New York, about 1910.

TURNER. *R. strigosus. Southern Thornless. Red Thornless. Baldwin's Choice.* Turner is an old variety, now seldom found, but still grown for home use and local markets in some places where less hardy and less adaptable sorts fail. It has some remarkable differences in plant and fruit from other varieties of this species, which make the accompanying description worth printing in full. Turner originated with J. B. Turner, Jacksonville, Illinois, soon after the close of the Civil War.

Plants medium in height and vigor, rather unproductive, spreading and drooping; canes very numerous, very slender, branching much, almost thornless, reddish-brown tinged with purple. New leaves at tip of suckers, bronzed; leaflets oblong-lanceolate; upper surface rugose and pubescent; lower surface greenish-gray, pubescent, midrib spiny and glandular. Flowers 7-10, in long open, leafy, prickly clusters. Fruits early, small, ovate, narrow; cavity small, rough; drupelets large,

elliptical, cohering poorly so that the berries crumble; flesh coarse, soft, tender, sprightly, aromatic; quality poor; seeds small.

WELCH. *R. strigosus.* Welch is a variety grown somewhat generally in New Jersey, but apparently not grown elsewhere. It is prized for the extreme hardiness of the plant, and its large, firm, deep red, sweet berries, which ripen late and hang long. It is reported to be better liked than Cuthbert in some parts of New Jersey for commercial plantations. Its origin is not known. The author has not seen the variety, and material from which a technical description can be compiled seems not to exist.

BLACK RASPBERRIES

BLACK PEARL. Fig. 245. Although a new variety, Black Pearl stands at the front of black raspberries. The plants are about all that could be desired in hardiness, healthfulness, and productiveness; while the berries are large and glossy black, very inviting in appearance, and of good quality, falling short only in being a little too variable in size. The season is early but somewhat short, the crop maturing a week or more earlier than the well-known Gregg. Black Pearl is in favor with evaporators, especially in cold climates, and where summer drouths parch the land.

245. Black Pearl. (×1)

The variety was found as a chance seedling by Herman Krumris, St. Joseph, Missouri, in 1905, and was introduced in 1907.

Plants vigorous, upright, very productive; canes numerous, stocky, dull brownish-red, with heavy bloom; spines numerous, slender. Leaflets small, dark green, rugose, heavily pubescent beneath. Flowers early, 10-12, in short, close, leafy clusters. Fruits early, large, hemispherical, glossy black; drupelets numerous, small, cohering strongly; flesh firm, rather dry, sprightly, rich; quality very good; seeds small.

CUMBERLAND. Until a few years ago, Cumberland was the most widely and commonly grown black raspberry. Hardiness and productiveness of plant and large size and high quality of fruit were the assets which gave it supremacy. It is now hardly more popular than several other sorts, falling from former popularity chiefly because of susceptibility to anthracnose. It is grown more largely for shipping fresh than for evaporating. Cumberland originated with David Miller, Camp Hill, Pennsylvania, and after having been grown locally many years was introduced about 1898.

Plants tall, vigorous, upright, very hardy, very productive, susceptible to anthracnose; canes medium in number, light reddish-brown, with straight, stray prickles. Foliage typical of the species. Flowers 12-14, in short, close, leafy, compact, prickly clusters. Fruit midseason, large, conical, glossy black; torus small, releasing the berry readily; drupelets large, round; flesh firm, juicy, sweet, rich; quality very good; seeds small.

DIAMOND. *Black Diamond.* Introduced by C. W. Stuart & Co., Newark, New York, in 1896, Diamond made a fine record in western New York for several years, but is now being discarded because the berries are small and variable in size. The variety was never much grown out of the region in which it originated.

Plants tall, vigorous, spreading, productive, hardy. Fruits midseason, small, broadly hemispherical, irregular in shape, black with a tinge of red; flesh firm, sprightly, fair to good; quality good; seeds large.

DOOLITTLE. *Joslyn. American Improved.* Doolittle, once the most popular of all raspberries, was superseded by Soughegan, which, in its turn, gave way to Gregg, now pushed to the rear by Black Pearl and Plum Farmer. This was the first black raspberry to acquire prominence as a commercial fruit. The variety was exceedingly variable at first, acquiring fixity of type only after years of selection, and differed so little from the wild black raspberry that it is probable that Doolittle was not derived from a single plant, but from wild plants in general. The name at first represented not so much a variety as the method of propagation adopted by the originator, in which tips from one-year-old plants were used. H. H. Doolittle, Oaks Corners, New York, was the originator of the method of propagation, and years later a selected strain took his name. Doolittle is now seldom found, and its rarity makes a description unnecessary.

EUREKA. Eureka was at one time much prized as an early black raspberry, but is being cultivated less and less, although many nurserymen still find a demand for it. It has the fatal fault of having few canes, hence is unproductive, and the plants are multiplied only with difficulty. The variety originated with Jason Kester, New Carlisle, Ohio, about 1885.

Plants vigorous, upright-spreading, unproductive, hardy; canes stocky, dark reddish-brown with numerous

strong, straight prickles. Foliage typical of the species. Flowers 11-13, in short clusters. Fruit medium in size, hemispherical, irregular in shape, dull black; drupelets small, numerous, oval, cohering strongly; flesh rather dry, firm, sprightly; quality good; seeds small.

GREGG. Fig. 246. *Great Western. Hoosier Mammoth. Western Triumph.* At one time the leading black raspberry, Gregg is gradually passing out. The plants are too tender for northern climates; too susceptible to the ills

246. Gregg. (×1)

of the species; are not adapted to many soils; and do not mature in a short season. To offset this list of faults, three meritorious qualities may be named: the berries are about all that could be desired—large, handsome, and of very good quality; the plants are very productive where they thrive; the fruit is one of the best for evaporating, a smaller quantity of fresh fruit being required for a pound of dried fruit than of almost any other variety. The original plant was found growing wild on the Gregg farm, Ohio County, Indiana, in 1866.

Plants of medium vigor, tender to cold, productive, spreading in growth; canes rather few, brown, glaucous with a few strong, straight prickles. Leaflets 3-5, dark green above, greenish-gray and pubescent beneath. Flowers 8-14, in short, close, leafy clusters on tips of the branches. Fruit late, large, broadly hemispherical, black with tinge of purple and heavy bloom; drupelets large, numerous, round, cohering strongly; flesh firm, juicy, rich and highly flavored; quality good; seeds small.

HILBORN. Hilborn has many characters that commend it for commercial plantings, and was a prime favorite, and still is somewhat of a favorite, in Ontario and parts of Ohio. The plants are vigorous, hardy, healthy, and productive, and the fruits are large, firm, and very good in flavor, ripening as second-early. Despite the list of merits, however, the variety does not rise far enough above mediocrity in the most essential characters to enable it to compete with several newer black raspberries. Hilborn was found on an old raspberry plantation on the farm of W. W. Hilborn, Leamington, Ontario, in 1886. Data are not available for a technical description.

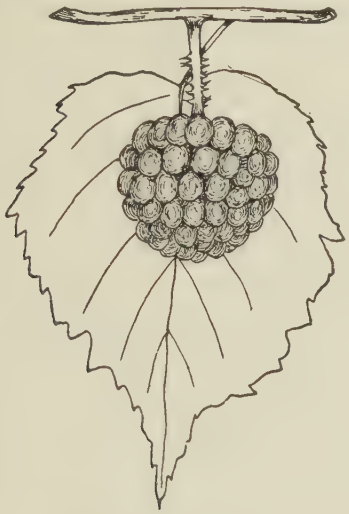
HONEYSWEET. Honeysweet is one of the newest candidates for commercial berry plantations. On the grounds of the originator, the variety makes so good a showing that several nurserymen are now putting it out as most desirable as a money-maker or for home plantations. Opportunity has not occurred to make a full description of plant and berry, but the following are their salient characters: the plants seem to be satisfactory in all the qualities requisite for a commercial black raspberry; the fruits are of large size, glossy black and of a distinct flavor, rich, very sweet, aromatic, and very nearly perfect in the characters that constitute quality in black raspberries. The fruit ripens in early midseason and can be left on the bushes longer than that of most other varieties. The product is said to be very good for culinary purposes, requiring less sugar than other berries, and to evaporate well. The original plant was found as a chance seedling on the farm of A. B. Katkamier, Macedon, New York, in 1912.

HOOSIER. Hoosier is a promising black raspberry for the Middle West. It is a selection from a large number of seedlings grown to secure a hardy and disease-resistant variety, but, on the grounds of the New York Agricultural Experiment Station, Geneva, New York, it is neither hardier nor more resistant to diseases than the average variety of its species; in fact, it is marked as susceptible to anthracnose. There the variety fails also in hot, dry summers. Notwithstanding the experiences noted, it is well spoken of by many. Hoosier originated on the farm of John Dunn, Pekin, Indiana, about 1895.

Plants medium in size and vigor, productive, upright; canes medium in number, rather stocky, dull reddish-brown with strong, straight spines. Leaflets usually 3, large, dark green above, greenish-gray beneath. Flowers 10-12, in very short, compact, leafy clusters. Fruit midseason, large, hemispherical, glossy black; torus small, releasing the berry readily; drupelets large, numerous, round; flesh dark red, firm, juicy, subacid, rich, with pleasant aroma; quality good; seeds large, hard.

KANSAS. Fig. 247. Long a prominent commercial black raspberry, Kansas is more often and better characterized by its faults than by its virtues. Chief of the faults is susceptibility to winter-killing, although defective fruits, the berries being often imperfect and variable in size and shape, stand against the variety as markedly as the defect in the plant. Nevertheless, the variety finds favor and is largely grown, although it is being replaced by Plum Farmer. The original plant

was a chance seedling on the farm of A. H. Griesa, Lawrence, Kansas, found in 1884, and the variety was introduced in 1891.



247. Kansas. (×1)

Plants medium in size and vigor, upright-spreading, very productive, tender to cold; canes numerous, stocky, reddish-brown, with many strong prickles. Leaflets usually 3, rather small, typical of the species. Flowers 10-12, in short, compact, leafy clusters at the tips of branches. Fruit midseason, medium to large, broadly hemispherical, variable in size and shape, with many imperfect berries, glossy black; drupelets rather small, numerous, round; flesh firm, rather dry, subacid; quality good; seeds large, hard.

KING OF CLIFFS. Several black raspberries have been introduced in recent years as everbearing. Perhaps King of Cliffs is as good as any, although one can only condemn it with faint praise as to other characters than everbearing. The plant resembles that of Cumberland, of which it is supposed to be a seedling. The berries are of fair size, jet black, and of good flavor. The variety was introduced by Bradley Brothers, Makanda, Illinois, in 1905.

OHIO. *Alden.* Before the coming of canning and quick transporation of fresh fruit, black raspberries were grown in great quantities to evaporate, and Ohio was the variety best suited for this purpose, yielding more pounds to a bushel of fresh fruit than any other black raspberry, for the reason that the seeds are large and heavy and the flesh is firm and dry. With the decline of the evaporation of berries, Ohio is passing out, although it is still grown where the drying industry survives. The variety originated about 1865 with Hiram Van Dusen, Palmyra, New York.

Plants of medium size and vigor, productive, upright-spreading, hardy; canes stocky, reddish-brown, numerous, with slender spines mostly at the base. Leaflets 3, small on the old canes, rather light green. Flowers 9-11, in short, leafy clusters. Fruit midseason, hemispherical, dull black; drupelets of medium size, oval, numerous, cohering weakly; flesh firm, dry, mild subacid; quality rather poor; seeds large, hard.

OLDER. Once popular in the Middle West and still under cultivation in Iowa and Minnesota, Older is being discarded for newer and better varieties. The plant is described as especially hardy, very vigorous, withstanding drouth well, and as having a very drooping, almost trailing, habit. The berries are large, jet black, bloomless, of good but not high quality. The original plant was found in a garden of a Mr. Older, Independence, Iowa, in 1872.

PALMER. *Acme.* Now almost lost to cultivation, Palmer was at one time the standard early black raspberry, and, in particular, was highly prized in parts of the Middle West. The plants, however, lack in productiveness, and the berries run small, so that Tyler, which ripens at the same time, was generally preferred where both could be grown. The variety was introduced by F. L. Palmer, Mansfield, Ohio, in 1888. Data are not available for a technical description.

PLUM FARMER. It is difficult to judge the merits of Plum Farmer, now in the first flush of popularity; but the indications are that it is to become one of the leading commercial black raspberries for eastern America. While the plants are preëminently vigorous, hardy, healthy, and productive, the chief merits are in the fruits, which ripen early, are large, beautiful, of high quality, and ship well. All in all, it is a fine new fruit. The first plant was found by L. J. Farmer, Pulaski, New York, in a shipment of raspberries from Ohio, about 1892, from which introduction was begun in 1895.

Plants vigorous, upright, dense, hardy, very productive, healthy; canes stocky, long, numerous, round, bright red, heavily overspread with dense bloom; prickles large and long, thick, strong, straight, sharp, medium in number; branches thick, long, numerous, reddish, densely coated with bloom, with internodes of medium length. Fruit early, easily picked, ships well, one of the best to withstand severe drouth; berries large, very black, covered with bloom, firm, uniform, sprightly at first, becoming mild at full maturity, juicy; quality good; seeds small, hard.

SCARFF. A seedling of Gregg and at first called Improved Gregg, Scarff is well spoken of by growers in Ohio and Maryland. On the grounds of the New York Agricultural Experiment Station, Geneva, New York, where the author has seen them, the variety is a failure, but the plants seem to have been abnormal from the start. The plants are usually satisfactory, but it is the fruit that attracts particular attention. The berries are described as the largest of black raspberries and as of highest quality. The variety was introduced by W. N. Scarff, New Carlisle, Ohio, in 1906.

SOUGHEGAN. For many years Soughegan divided honors with Tyler, the two being almost identical, as the best early black rasp-

berry. The berries were small and poor in quality, so that with the coming of newer kinds Soughegan and Tyler gave way and are now seldom found. The variety originated with J. A. Carlton, Soughegan River, New Hampshire, in 1870.

Plants of medium size, vigor, hardiness and productiveness; canes few, reddish-brown, with strong, straight prickles. Leaflets 3, the two lower ones often deeply lobed. Flowers 10-14, in short, compact, leafy, prickly clusters. Fruit very early, medium size, broadly hemispherical, variable in size and shape, glossy black; drupelets numerous, small, round, cohering strongly; flesh firm, rather dry, sweet, somewhat insipid; quality rather poor; seeds small, hard.

TYLER. As has been said in the discussion of Soughegan, Tyler and Soughegan are almost identical, although it is certain that they originated in widely separated regions. Both are undoubtedly seedlings of Doolittle, which they much resemble, and the place of which they took and long held as the best early black raspberries,—a place now filled by Plum Farmer. Tyler is thought to be somewhat hardier than Soughegan. It is still offered by a few nurserymen. The variety originated with Nathan Tyler, Auburn, New York, about 1880.

WINFIELD. Winfield has been rather widely distributed, and is offered by many nurserymen, but, as the description shows, has few good characters to recommend it. The berries are variable in size and shape, crumble in picking, are poor in quality, and are borne in compact bunches, which make picking difficult. In the East, plants and fruits are a sorry sight in the company of good varieties; the variety may have greater value in the Middle West. Winfield was introduced by the Winfield Nursery Co., Winfield, Kansas, in 1908.

Plants of medium size, vigor and productiveness, spreading; canes medium in number, stocky, with strong, straight prickles. Flowers 11-12, borne in short, very compact clusters. Fruit midseason, small to large, hemispherical, exceedingly variable in size and shape, dull black; adhering rather tightly to the torus; drupelets large, few to many, round, cohering poorly so that the berries crumble; flesh coarse, rather dry, firm, mild, insipid; quality poor; seeds large, hard.

CHAPTER XVII

VARIETIES OF BLACKBERRIES AND DEWBERRIES

Blackberries and dewberries, long neglected by fruit-growers, are becoming more and more important in regions devoted to small-fruits. In the great Southwest—Texas and neighboring states—the introduction and wide cultivation of these two berries make them commercial fruits of first rank, while the widespread culture of the loganberry and similar varieties on the Pacific slope is one of the remarkable agricultural events of the age. In the East, there is possibly a falling off in the acreage of these brambles, but the introduction of many new varieties is likely to stimulate the lagging industry until it surpasses its past magnitude. At present, nurserymen offer about 60 blackberries and 8 or 10 dewberries, but each year sees new introductions of both groups, so that, even with the inevitable discarding of old varieties, there is likely to be an increase from year to year in named sorts.

The progeny of at least twelve species are to be found in the cultivated blackberries and dewberries of this continent. These have been crossed and recrossed until it is now quite impossible to classify varieties with reference to the species from which they came. An attempt might be made, if fuller knowledge of the species was available, but these exceedingly variable brambles still puzzle botanists, and the foundation upon which to begin classifying varieties is so poor that attempts at classification are not worth while. About all that can be done is roughly to group blackberries in one division and dewberries in another, not an easy task, for the characters of the two fruits in the wild forms intermingle, and by crossing have been further confused under cultivation. Classification of cultivated varieties awaits a better classification of wild forms than now exists.

248. Agawam. (×1)

BLACKBERRIES

AGAWAM. Fig. 248. For many years Agawam was the most prized of early blackberries, and it is still widely grown, but not so commonly found in commercial plantations as formerly. Productiveness of plant and high quality and earliness of fruit are the chief assets. The faults are: the plants suffer too much from winter-killing, and the berries run too small to make the variety wholly satisfactory. The variety originated with John Perkins, Ipswich, Massachusetts, between 1865 and 1870.

Plants of medium size and vigor, productive, upright-spreading; canes numerous, tender to cold, furrowed, dark reddish-brown, covered with strong, straight prickles. Leaflets 3-5, long, with a tapering apex, very pubescent beneath; margin finely, sometimes doubly serrate. Flowers 1 inch across, 12-16, in long, open, prickly clusters. Fruit early, small, ¾ inch in length, broad-oblong, glossy black; drupelets few, large, round; core white, soft; flesh rather soft, sweet and pleasant; quality very good; seeds of medium size, soft.

ANCIENT BRITON. Without question the hardiest blackberry, Ancient Briton is a prime favorite in northern regions, Wisconsin and Minnesota particularly. The plants are very vigorous, very productive, and the berries, while not large nor especially inviting in appearance, are of the best quality. It is an old sort and a well-established standard for commercial plantations. The origin of the variety is uncertain, but it came into prominence in Wisconsin in the sixties of last century.

Plants medium in size and vigor, very hardy, very productive; canes moderately numerous, roundish, brown, with numerous thick, straight prickles. Leaflets 5, palmate, oblong-oval, heavily pubescent above and below; margin serrate and hairy. Flowers 1¼ inches in diameter, 16-18, in a long, open, prickly raceme. Fruit medium to late, medium to large, long, rather narrow, tapering, glossy black; core white, conical, soft; drupelets large, numerous, elliptical; flesh tender, juicy, sweet but sprightly; quality good.

BLACK DIAMOND. *Atlantic. Ewings Wonder. Star. Wonder.* This variety, under its several synonyms, is offered by a number of nurserymen. It is listed as a dewberry by some, but it properly belongs with the Evergreen blackberry, with which it is so nearly identical that it needs no separate description. It is but half-hardy, and therefore of little value in the East, although it is rather commonly grown in southern New Jersey, but even there every cold winter takes its toll. The variety is said to have originated with G. H. Liepe, Cologne, New York, early in this century.

BLOWERS. The plants of Blowers are so capricious, responding to every diversity in season, soil, and climate, and so many of the berries are imperfect, even in locations suitable for the plants, that it is worthless as a com-

mercial variety. Nevertheless, many nurserymen offer it and report it successful in parts of North America. It originated with H. W. Blowers, Westfield, New York, about 1888.

Plants tall, very vigorous, not hardy, productive; canes moderately numerous, stocky, furrowed, reddish-brown, with numerous strong, straight prickles. Flowers 1½ inches in diameter, 8-10 in open, short, leafy clusters. Fruit midseason, ripening over a very long period, 1 inch long, rather narrow, tapering, variable in size, glossy black; core soft, conical; drupelets large, variable in size, round; flesh soft, sweet, mild; quality good; seeds rather large.

DALLAS. Dallas is supposed to be a blackberry-dewberry hybrid, although at Geneva, New York, it shows little if any dewberry parentage. The variety has little to recommend it for the North, but seems to find favor in Texas and Oklahoma. It is a native of Texas, but where or when it originated cannot be learned.

Plants very vigorous, drooping, half-hardy, productive; canes long, with numerous sharp spines. Leaflets 5, palmate, coarsely and deeply serrate. Flowers very large, 2 inches in diameter, 5-7, in long, open, leafy, prickly corymbs. Fruit early midseason, large, almost hemispherical; flesh firm, juicy, sweet; quality very good.

DORCHESTER. *Improved High Bush.* Although introduced in 1850, this variety is still catalogued by a few nurserymen, and finds favor in scattered localities, mostly in New England. It is usually named as the first variety to have been cultivated. It might well be grown in competition with the many newer kinds, were the vines hardier and more productive. The fruit is excellent. Dorchester was first brought to notice at the Massachusetts Horticultural Society in 1841 by Eliphalet Thayer, Dorchester, Massachusetts.

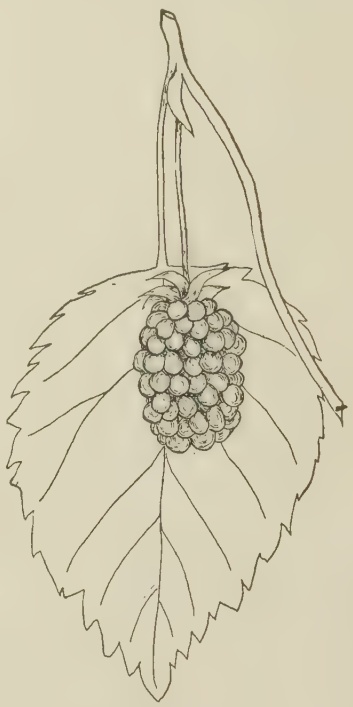
Plants vigorous, upright, stocky, rather tender to cold, moderately productive, with numerous strong prickles. Fruit early, of medium size, glossy black, elongated; flesh rather soft, sweet, rich; quality good.

EARLY HARVEST. Fig. 249. One of the earliest blackberries to ripen its crop, Early Harvest is valuable only for this reason. In the North, the plants are often winter-killed, and in the South, where they are very productive and ripen the crop extra early, they are susceptible to rust. The variety is prized in parts of California. The original plant was found growing wild in Illinois some time previous to 1880.

Plants moderately vigorous and productive, winter-kill in the North; canes long, numerous, deeply furrowed, with strong, straight prickles. Leaflets 3-5, palmate, ovate-lanceolate, deeply and sometimes doubly serrate. Flowers 1½ inches in diameter, 8-10, in long, open racemes. Fruit early, ripening over a long season, medium in size, conical, glossy black; drupelets round, numerous, rather small; flesh tender, sweet; quality good; core soft, white; seeds small, hard.

EARLY KING. Early King ripens a week later than Early Harvest, being the second earliest blackberry. The plants lack in hardiness, and, like all early blackberries, are not very productive; to which may be added a third fault, susceptibility to blackberry-rust. The variety is worth growing only in mild eastern climates.

Plants low, vigorous, half-hardy, moderately productive, prickles long and numerous, susceptible to rust. Fruit early, with a short season, medium size, glossy black, oblong-hemispherical, irregular, ripe as soon as black; flesh soft, very sweet; quality good.



249. Early Harvest. (×1)

ELDORADO. For many years Eldorado was the first main-crop variety to ripen; it has, with other notable virtues, great hardiness and freedom from the blackberry-rust in the plant, and handsome appearance and exceptionally high quality in the fruit. Although an old sort, it is still much prized for home and market east of the Rocky Mountains, and in this great region fails only in the far South. The variety originated as an accidental seedling in Preble County, Ohio, about 1880.

Plants tall, vigorous, very hardy, productive, healthy; canes numerous, with many large prickles. Flowers 1½ inches in diameter, 10-12, in long, open, very spiny racemes. Fruit early midseason, ripening period very long, elongated-hemispherical, jet black; drupelets large, round, few; core soft, white, conical; flesh firm, juicy, sweet, rich; quality very good; seeds small.

ERIE. *Uncle Tom.* With several characters to recommend it, Erie has been long under general cultivation. The plants are very vigorous, hardy, productive, and free

from the dreaded blackberry-rust. The berries, when well grown, are extraordinary large, and the quality is good when the fruit is mature. Since, however, the berries remain hard and sour long after turning black, picking is often hurried, and this gives the fruit the reputation of being poor in quality. The original plant of Erie was found near Tallmadge, Ohio, about 1876. It is probably a seedling of the older Lawton, which it resembles.

Plants of moderate height, very vigorous, hardy, productive, upright-spreading; canes numerous, stocky, deeply furrowed, with straight, slender prickles. Leaflets palmate, large, ovate-lanceolate, pubescent on both surfaces. Flowers very large, 1¾ inches in diameter, 8-12, borne in long, open, leafy racemes. Fruit midseason, large, cylindrical, tapering irregularly, glossy black; core cylindrical, rather soft; drupelets numerous, rather small, round; flesh soft, juicy, sweet when fully ripe, rich; quality good; seeds of medium size, hard.

GIANT HIMALAYA. Fig. 250. This much talked about berry is probably little removed from *R. thyrsanthus,* an inhabitant

250. Giant Himalaya. (×1)

of central Europe, which has found its way to various parts of the world, being rechristened as it was taken from place to place. As advertised in the United States it is the most pretentious cheat in the berry garden, yet in some respects it is a remarkable addition to edible brambles, and therefore needs consideration. The name, it should be said at once, is misleading. The species probably does not grow in the Himalaya Mountains, although the story of its origin was that an English traveler brought seed for it from the Himalayas to Luther Burbank about 1898, from which the variety came. The variety, or its counterpart, has been known in Germany under the name Theodore Reimers.

The plants are too tender to cold for northern regions. In the Pacific states, Himalaya is remarkable for the vigor and productiveness of the plants, but in mild climates in the East, regions south of Pennsylvania, the plants are very vigorous but almost barren. In all regions, the plants need cross-pollination, and even so, produce many imperfect fruits. The berries at best are poor in quality and uninviting in appearance. The long, trailing, thorny, evergreen canes are almost unmanageable on trellis or stake. The value of the plant seems to lie in the possibilities it furnishes for hybridization. The several hybrids now known, of which it is one parent, promise much. Vigor and productiveness of plant are the characters for which it should be used in hybridization.

HAUPT. Texas has enriched pomology with several notable blackberry-dewberry crosses. Among these is Haupt, a name to be found rather commonly in lists of brambles for the Southwest, which seems to stand for three or four distinct crosses between the blackberry and the dewberry. Catalogs offering Haupt speak of fruit and plant in superlative terms, but until the several types are segregated, berry-growers cannot know what they are buying. The original plant, or possibly plants, came from W. W. Haupt, Kyle, Texas, about 1898.

ICEBERG. One of the few white blackberries worth trying, Iceberg is little more than a curiosity in the East, but has some value in California as a fruit for home use. At Geneva, New York, the plants must be protected against winter-killing. The variety originated with Luther Burbank about 1895; according to whom it is a third generation descendant from a cross between Lawton and White Crystal. The plant is described as much like that of Lawton, while the berries in California are said to be large, amber-white, soft, and of very good quality.

JORDAN. Jordan is offered by several nurserymen in Texas, where the variety seems to find considerable favor. Outside of Texas it seems to be grown but little. The following description is made from plants on the grounds of the New York Agricultural Experiment Station. Jordan originated with James Nimon, Denison, Texas, about 1895.

Plants drooping or semi-trailing, moderately vigorous and productive, half-hardy. Leaflets 5, palmate, oval, coarsely and unevenly serrate, in a double series. Flowers large, 1¾ inches in diameter, 5-8, in long, open, leafy corymbs. Fruit midseason, large, glossy black, oblate, exceedingly variable in size and shape; core hard, conical, rather short, white; drupelets large, round; flesh rather soft, sweet but sprightly; quality good; seeds medium in size, hard.

KITTATINNY. One of the first good blackberries, Kittatinny has an unbroken record of more than a half century as a standard commercial blackberry in the United States from the Atlantic to the Pacific. Possibly no variety has been or is more widely and largely grown. It equals the best representatives of its kind in quality of fruit, and

therefore holds a welcome place in all home plantations. Two faults mar an otherwise excellent variety; the plants are not hardy in cold climates, and are very susceptible to rust where that disease is rife. Kittatinny comes from the mountains of the same name in New Jersey, and was introduced by E. Williams about 1865.

Plants tall, vigorous, upright-spreading, productive, half-hardy; canes numerous, stocky, furrowed, reddish-brown, with long, strong, straight prickles. Leaflets large, oblong-lanceolate, pubescent above and beneath. Flowers 1¼ inches in diameter, 6-8, in rather short, open, leafy racemes. Fruit early midseason, medium size, oblong, variable in size and shape, jet black; core cylindrical, soft; drupelets large, round; flesh sweet, rich; quality very good; seeds small, soft.

LAWTON. *New Rochelle.* Lawton played an important part in the early history of cultivated blackberries in America, and was the second variety of this fruit introduced. It is still grown rather widely on the Pacific slope and somewhat in the East, being especially well liked for canning. It has lost commercial importance in the East, however, because the plants do not withstand cold well and are susceptible to rust. The fruit is not ripe until jet black, when the quality is of the best; picked too soon, as it often is, the berry is sour and bitter. Lawton was introduced by William Lawton, New Rochelle, New York, about 1848.

Plants stocky, vigorous, productive, tender to cold, susceptible to rust, with numerous large prickles. Fruit late midseason, large, jet black, becoming bronzed when over-ripe; core large and rather hard; flesh soft, sweet, rich; quality very good.

McDONALD. Fig. 251. McDonald is a blackberry-dewberry hybrid much grown in Texas, Oklahoma, Missouri, and other parts of the Southwest. The plants are said to be very vigorous, remarkably productive, wholly immune to rust, better able to withstand drouth

251. McDonald. (×1)

than most other brambles, and to ripen their crop two weeks before the earliest blackberry. The canes trail the first season, but send up strong, drooping canes in succeeding years. To offset this list of virtues, a serious fault must be named: the variety is self-sterile and must be inter-planted with another blackberry for a pollenizer. The berries are described as large, oblong, very good in quality, and as hanging in good condition on the vines for three or four days after ripening. From the accounts of all pomologists in the Southwest, McDonald seems to be a valuable acquisition. The origin of the variety seems not to be definite, but it came into prominence in the Southwest about 1912.

MAMMOTH. *Lowberry. Black Loganberry.* This is another blackberry-dewberry hybrid usually listed with blackberries. The parents are said to be Early Texas, a blackberry from Texas much grown in California, and the western dewberry, *R. vitifolius.* Mammoth thrives only on the Pacific slope, being too tender to cold for the East. The variety is remarkable for its enormous berries and its long, trailing vines, which sometimes attain a length of twenty-five or thirty feet. The canes are stout and covered with small, short spines; they grow upright several feet and then begin to trail. Eventually the tips take root; tipping is the method of propagation. The leaves are semi-evergreen in California. The berries, while somewhat soft for distant shipment, are excellent for local markets and home use, being of high quality when fully ripe. Mammoth is much grown in California. The blossoms are self-sterile and the loganberry makes a good pollenizer.

Two other varieties very similar to Mammoth are being offered by nurserymen under the names Tribble and Cory. The canes of the latter are said to be thornless. Neither has been grown long enough to give sufficient opportunity to judge their merits. The variety came from a seedling grown by J. H. Logan with whom the loganberry originated.

MERSEREAU. Mersereau has long been a dependable variety for both market and home in the northern and eastern states. It fails in the South because of susceptibility to rust. Nurserymen complain that it is difficult to propagate. Mersereau is a seedling of Snyder, long a standard, which it surpasses in vigor of plant and in size and quality of berry. The variety originated with J. M. Mersereau, Cayuga, New York, about 1890.

Plants tall, vigorous, upright, hardy, productive, susceptible to rust; canes numerous, light red, furrowed, with long, strong, straight prickles. Leaflets 3-5, palmate, oval-lanceolate, pale hoary pubescence beneath, with sharp narrow serrations in a double series. Flowers 1½ inches in diameter, 8-10, in short, compact, leafy racemes. Fruit late midseason, season short, large, oblong-conical, black, retaining color well after picking; drupelets large, round; core soft, conical, white; flesh firm, but tender, juicy, sweet, rich; quality very good; seeds small, soft.

RATHBUN. Fig. 252. In appearance, the berries of Rathbun are flawless, and the flavor is very good; but the plants leave much to be desired. They are only moderate in vigor and productiveness, sucker too sparingly, are susceptible to rust, winter-kill, being only half-hardy, and bear flowers which must be cross-pollenized. Rathbun is a blackberry-dewberry hybrid having the peculiarity of rooting at the tips. Despite the list of faults, it is well liked in mild climates east of the

Rocky Mountains. The variety originated with Alvin Rathbun, Silver Creek, New York, about 1885.

252. Rathbun. (×1)

Plants of medium size and vigor, half-hardy, moderately productive; canes few, angular, greenish, with straight, slender spines. Flowers 1¾ inches in diameter, 3-7, in short, open, leafy racemes with a few prickles, sterile or nearly so. Fruit early, very large, somewhat variable, cylindrical, jet black; core cylindrical, soft, white; drupelets large, round, numerous; flesh firm, juicy, sweet, rich; quality very good; seeds large, soft.

253. Snyder. (×1)

SNYDER. Fig. 253. The fruit is not inviting in appearance and taste and turns red after picking, faults that condemn Snyder; but the plants rejoice in such vigor, health, productiveness, and hardiness that for seventy years the variety has been a standard. At the beginning of this century, Snyder was probably the best known of all blackberries, but several rivals in season now surpass it, so that its popularity is rapidly on the wane, although the variety is still to be found from the Atlantic to the Pacific, except in the South. It does well on rather poor, light soils. The variety originated with Henry Snyder, La Porte, Indiana, about 1851.

Plants tall, upright, very vigorous, hardy and productive; canes numerous, stocky, rough, furrowed, reddish-brown, with many very large, thick, straight thorns. Leaflets mostly 5, palmate, ovate-lanceolate, narrow, pubescent above and beneath, apex acute, sharply serrate in a double series. Flowers 1½ inches in diameter, 15-20, in long, leafy racemes. Fruit mid-season, season short, of medium size, glossy black; core elongated, soft, white; drupelets large, round; flesh firm, sweet, poorly flavored; quality poor; seeds large, soft.

SORSBY. This variety is recommended by small-fruit growers in Texas and neighboring states, but finds no favor elsewhere. On the grounds of the New York Agricultural Experiment Station, the plants flourish like the biblical bay, but refuse to set fruit other than mere nubbins. The variety, even where it does well, is more or less self-sterile, and must be set with other sorts to pollenize it. It is said to be a dewberry-blackberry hybrid, which, in plant, closely resembles McDonald, although the berries are smaller than those of the latter variety but even more delicious. Sorsby is said to be taking the place of Early Harvest in parts of Texas. Except that it is a comparatively recent acquisition from Texas, nothing seems to be known of the origin of the variety.

TAYLOR. Fig. 254. Taylor has long been the favorite late blackberry with commercial berry-growers, and is prized also because it surpasses most of its garden associates in hardiness of bush, in immunity to rust, and in quality of fruit. It falls short only in productiveness, for it is but moderately productive in many localities. The plants are characterized by greenish-yellow canes, sometimes tinted with red. Although an old variety, having originated with a Mr. Taylor, Spiceland, Indiana, in 1867, it is still one of the mainstays of commercial growers east of the Rocky Mountains.

254. Taylor. (×1)

Plants tall, vigorous, very hardy, moderately productive, immune to rust; canes numerous, slender, angular or nearly round, greenish-yellow, sometimes reddish, with numerous straight prickles. Leaflets 3-5, oblong-lanceolate, pubescent on both surfaces. Flowers 9-15, in long, compact, leafy, prickly racemes. Fruit late, medium in size, thimble-shaped, glossy black; core soft, white; flesh rather soft, juicy, sweet, rich; quality very good; seeds of medium size, hard.

TEXAS EARLY. *Crandall.* This variety is held in high esteem in California, where the fruit matures early and ripens during a long period. The high quality of the fruit also commends it. Crandall originated in Texas, but when, where, and by whom is not known. It was introduced in California about 1875 by J. R. Crandall of Auburn, New York, whose name it sometimes bears.

Plants vigorous, upright, productive, hardy at Geneva, New York; canes numerous, resembling those of Lawton very closely, as do the leaves. Flowers 6-8, in long, open, leafy, prickly racemes. Fruit very early, ripening period long, large; flesh firm, sweet, rich; quality very good.

WARD. As a favorite late blackberry in New Jersey, Ward was a few years ago more largely grown than any other variety, and is still one of the mainstays for a late crop. It seems scarcely to have found a foothold elsewhere, although it is occasionally mentioned in other states, in most of which it is grown rather poorly. Ward is a seedling of Kittatinny, which it resembles in almost every particular, surpassing its parent in vigor, productiveness, freedom from rust and quality of fruit. The original plant was found growing wild in New Jersey about 1900.

WILSON EARLY. Few varieties have had their merits set forth in more laudatory terms than Wilson Early a generation ago. In many localities it was a mainstay for the early crop both for home and market. Although not generally grown now, the variety is still to be found in parts of the East, New Jersey being the state in which it is most prized. The plants are precariously hardy, not always productive, and bear many imperfect flowers, most of which are more or less doubled. In some localities, the plant overbears, and to prevent this it should be closely pruned. Wilson Early is probably a blackberry-dewberry hybrid. The variety originated with John Wilson, Burlington, New Jersey, about 1854.

Plants upright or often semi-trailing, the trailing shoots rooting at the tips, medium in vigor, half-hardy, variable in productiveness. Leaflets, 3 to 5, broad-lanceolate. Flowers 1½ inches in diameter, often double and imperfect, 4-6, in long, open, leafy racemes. Fruit very large, often irregular and imperfect, tapering toward the apex; drupelets few, very large, round, variable in size; flesh firm, sweet, rich; quality very good.

DEWBERRIES

AUGHINBAUGH. This variety is the chief representative of the wild western dewberry, *R. vitifolius,* and probably is the parent of the loganberry. Its culture is confined to California, where, before the advent of the loganberry, it was much grown, but it is now rapidly passing from cultivation. The flowers are pistillate, requiring pollen from another variety to set fruit. The plant is described as unsatisfactory, lacking in vigor and productiveness. The details of the origin of the variety are not known, but it has been in cultivation since 1875, and is supposed to have been introduced by a man bearing the same name.

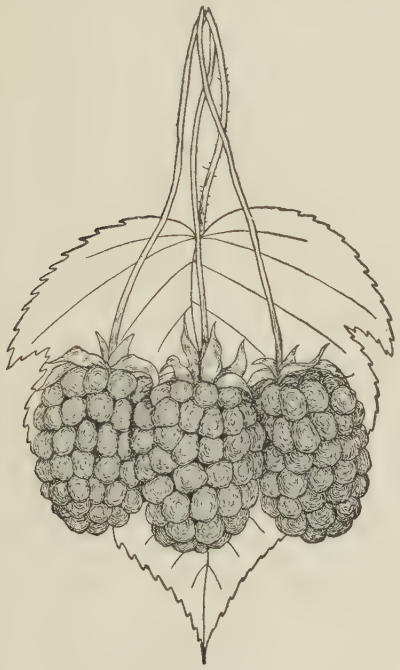
BARTEL. Bartel was the first dewberry to find favor with American pomologists. It was introduced by a Dr. Bartel, Huey, Illinois, about 1870, and, after the lapse of several years and an expenditure of much high-flown language in advertising, became widely established with berry-growers the country over, although never very commonly grown. The prostrate habit of growth seemed to be against it, as with all dewberries, but when it was discovered that the plants could be easily covered as a protection against winter-killing, the trailing habit became an asset rather than a liability. The variety may be occasionally found now, but it is becoming a rare sort, better dewberries having taken its place.

GARDENA. Comparatively rare elsewhere, Gardena is held in high esteem in southern California, where it originated early in this century in the town of the same name. The plants are described as healthy, very productive, withstanding frosts well, and ripening their crop early and during a short period. The berries are said to be large, firm of flesh, rich and sweet in flavor, and, all in all, of highest quality. The crop ripens about ten days before that of the well-known Lucretia. Gardena is supposed to be a seedling of Premo.

LAXTONBERRY. *Laxton.* Crosses between brambles are destined to play an important part in the berry-growing of the future; a dozen or more already have enriched pomology both as market crops and for the fruit-fancier. One of those of lesser importance, which has attained some prominence in England, and is grown somewhat on the Pacific slope, is the laxtonberry, a cross between the loganberry and the Superlative red raspberry. This interesting hybrid, having much the habit of growth of the loganberry, is listed with dewberries. The berry is much like that of the loganberry in color and flavor, but separates from the receptacle somewhat like a raspberry. Its blossoms are not wholly self-fertile, and the variety must be planted in proximity to the loganberry or a red raspberry.

LOGANBERRY. Fig. 255. *Logan Blackberry.* Now well past the first flush of popularity, the loganberry has taken a permanent place in American pomology as a distinct type of fruit. The new fruit possesses remarkable features in the plant which appeal to berry-growers, but it is the product which can be put profitably to more uses than any other

variety of bramble, that makes the loganberry the most valuable pomological introduction of the present generation. The fruit of the loganberry is prized for the fresh-fruit market, being enticing in appearance and pleasing in flavor; it is handsome and delectable as



255. Loganberry. (×½)

processed in the canneries, therefore finds favor with canners; well ripened, the crop gives a large proportion of the dried product to the fresh fruit, so that it is in demand for evaporation; lastly, the fruit makes a delicious non-alcoholic beverage, for which purpose it is now more used than for the other products.

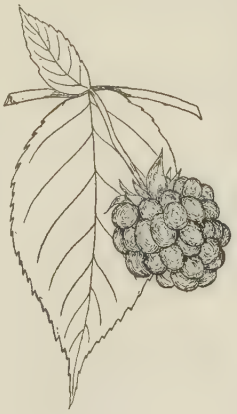
So far, the loganberry is successfully grown only in parts of California, Oregon and Washington where the temperature does not reach zero. The plants do not yield gracefully to the climates and soils of the regions east of the states named, succumbing to cold in the North and proving almost barren in the South. The largest centers of production at present are Sebastopol, California, and the great Willamette Valley of Oregon. Variously called a blackberry, a dewberry and a hybrid between the western dewberry and a red raspberry, the loganberry, by reason of its trailing canes, and habit of rooting at the tips, is probably best classified with the dewberries, it being, as most authorities now agree, a red-fruited variety of the western dewberry, *R. vitifolius*. The original plant was discovered by Judge J. H. Logan, Santa Cruz, California, in 1881, and was considered a hybrid between the Aughinbaugh dewberry and a red raspberry, a theory untenable in light of recent investigations. Plant and fruit are sufficiently well described in the description of *R. vitifolius*, page 274.

LUCRETIA. Fig. 256. Lucretia, which made its way slowly into popular favor, is now the best known and the most widely grown of all dewberries. It has attained this high place because endowed with a constitution fitting it for a great diversity of soils, and for

256. Lucretia. (×⅓)

a range in latitude from the coldest to the warmest in which dewberries can be grown. The plants have the faults of being susceptible to anthracnose, and of producing many double blossoms with resultant sterility. The quality of the fruit, while not the best, is good, but the large jet-black berries are more inviting in appearance than in taste. The original plant was discovered in West Virginia soon after the Civil War, but the variety was introduced from Ohio about 1876.

Plants vigorous, trailing, productive, half-hardy, requiring winter protection; canes slender, long, numerous, round, greenish-brown, with strong, rather blunt prickles. Leaflets 3-5, sometimes 7, oval, variable in shape, pubescent above and beneath, coarsely serrate. Flowers nearly 2 inches in diameter, 3-5, in short, open, leafy, prickly corymbs. Fruit early mid-season, large, cylindrical, tapering slightly, jet black; core long, conical, soft; drupelets large, round; flesh firm, juicy, sweet, rich; quality good; seeds large, soft.



257. Mahdi. (×⅓)

MAHDI. Fig. 257. Like the laxtonberry, Mahdi is a cross between the loganberry and a raspberry. It is still on probation, although the consensus

of opinion among those who have tried it is that it gives little promise for any purpose. It is said to ripen its fruit later than the loganberry. On the grounds of the New York Agricultural Experiment Station, Geneva, New York, it responds to climate and soil rather better than any other bramble of its type, but even so is of little value, and does not merit a detailed description.

MAYES. Fig. 258. *Austin Improved.* The dewberry and hybrids between it and the blackberry seem to be favorite small-fruits in Texas. Of the many dewberries and dewberry-like brambles in that state, Mayes is the leading variety. It seems to be comparatively rare elsewhere, although earliness and productiveness commend it. The berries are handsome and of excellent quality, but fail as commercial fruits because too soft to ship well. The canes are vigorous and productive, but subject to anthracnose and double-blossom. The fruit ripens about a week before that of Lucretia. The plants may be propagated either by tips or root-cuttings. The original plant was found growing wild in Texas by John Mayes about 1880.

258. Mayes. (×⅓)

Plants vigorous, productive, subject to anthracnose and double-blossom; canes trailing, long, slender, numerous. Leaflets 3-5, mostly sessile, variable in size, coarsely serrate in a double series. Flowers 1½ inches in diameter, 4-6 in axils of leaves and terminal. Fruit early, large, conical, broad at the base, jet black; core medium to soft; drupelets very large, round; flesh firm, juicy, sprightly; quality very good; seeds rather large, soft.

PHENOMENAL. This is a new fruit of the loganberry type, introduced by Luther Burbank as a cross between a variety of the western dewberry and Cuthbert red raspberry. Whether a cross or not, it is so similar to the loganberry, an offspring of the western dewberry, that it is usually classed with it; it may surpass it in some trivial characters, but according to all reports, is outmatched in important ones. Phenomenal is of small importance in loganberry districts, except about Los Angeles, California, where it is grown by some in preference to the older sort. The great drawback to its culture seems to be that the plants are dwarfed by a disease which cuts their life to but three or four profitable seasons. The berries, also, are subject to doubling, which disfigures them for the market. The essential difference in normal plants of the two varieties are: the canes of Phenomenal are a little hardier; the blossoms open a few days later; the berries are a little larger; and, while the flavor of the fruits of the two is similar, the juice of the loganberry makes the better beverage, the fruit of both being used most largely for their juice. The variety was introduced in 1912.

PREMO. Except for a few trivial differences, Premo might be said to be an early Lucretia, and is either a sport or a seedling from that variety. The plants are very like those of Lucretia, but ripen their crop a week or ten days earlier, are not so productive, and bear more imperfect flowers. The berries are smaller than those of Lucretia, but are just as firm in flesh and just as good in quality. This variety, a comparatively new acquisition, is becoming a favorite early fruit in many dewberry sections in the United States, especially in the South, and in North Carolina particularly. Data regarding the origin of the variety are lacking, but it has been under cultivation at least since 1905.

PRIMUS. Another variety of the loganberry type is Primus, introduced about 1890 by Luther Burbank as a cross between the western dewberry, *R. vitifolius* and *R. cratægifolius.* Its chief claim for recognition by berry-growers is that the crop ripens before that of loganberry. The variety fails and is being discarded because of several serious faults; the blossoms appear early and are caught by frosts; the berries cling and are bruised in picking, and are dull and unattractive in appearance; and the plants are rather more unmanageable in the plantation than those of other varieties of its type, all of which give trouble in staking or trellising. In foliage and canes, Primus is very similar to the loganberry. The variety was introduced by Burbank in 1893.

PART V

CURRANTS AND GOOSEBERRIES

CHAPTER XVIII

BOTANY OF CURRANTS AND GOOSEBERRIES

Several species of Ribes are very generally cultivated in cold temperate and even subarctic climates under the names currants and gooseberries. The two fruits are often grouped as groselles, from the French *groseilles,* a word now commonly applied to gooseberries, which, however, at one time included currants as well. Originally, the word currants was applied to small seedless raisins, produced from several varieties of grapes in the Levant, the name coming from Corinth, which was the center of the industry. The dried currants of commerce are the cured fruits of seedless grapes and not those of a species of Ribes, continuing the confusion in the nomenclature of the two fruits. Currants and gooseberries are very different in aspect of plant, and in appearance and taste of fruit, yet their close relationship is shown not only by similarities in the botanical characters upon which classifications are founded, but also by the hybridization of species of the two fruits and the possibility of intergrafting. Ribes is probably an Arabic name for *Rheum Ribes,* but is supposed by some to be the Latinized form of *riebs,* an old German word for currant.

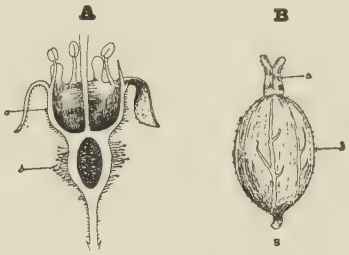
THE GENUS RIBES

To this genus belong the red, white, black, and golden currants of the gardens, representing several species; cultivated gooseberries coming from two or three species; and a dozen or more species cultivated as ornamentals for their flowers, fruits, or foliage. There are about 150 species of Ribes well distributed throughout the north temperate regions of both hemispheres and of South America. Many species not now cultivated offer possibilities for the garden through domestication or hybridization. The following characters of the genus are of importance to pomologists:

Low prickly or unarmed shrubs. Leaves deciduous or rarely evergreen, alternate, palmately lobed, often fascicled on the branches, mostly plaited in the bud. Flowers perfect or sometimes diœcious, 5-parted, borne in few- to many-flowered racemes, in edible-fruited species greenish, reddish or yellow and mostly insignificant; calyx-tube cylindric to rotate, usually colored; petals smaller than the sepals, often minute; ovary inferior, 1-celled; styles 1 or 2. Fruit a many seeded, pulpy berry, crowned by the remains of the calyx, red, white, purple, scarlet, yellow or greenish, the edible species ripening their fruits in early summer.

The berry of the currant and gooseberry is an indehiscent, many-seeded fruit, soft and juicy throughout, the product of the inferior ovary of the flower. Fig. 259 shows the flower and fruit of a gooseberry, illustrating the structure of these organs for the genus.

There are no other pomological plants with which currants and gooseberries can possibly be confused, and the species constitute natural groups so distinct that one can hardly be mistaken for another. But it is difficult indeed to make sure of the horticultural varieties of the several species. The pomological nomenclature of these fruits is in a sorry state of



259. Flower and fruit of gooseberry. *A,* flower; *B,* half-ripe fruit; *a,* calyx-tube; *b,* ovary.

confusion. Varieties of both currants and gooseberries are often so nearly alike that it is almost impossible to distinguish them. Nurserymen have been remiss in renaming old sorts, and frequently substitute one kind for another; varieties of currants, at least, come nearly true to seed; and few good descriptions have been published of varieties. Those interested in these fruits, therefore, in order to identify varieties, must be well informed as to the differences in organs upon which botanical and pomological classifications are founded.

Size and form of plant.

The several cultivated species of currants and gooseberries are told at a glance by the size and habit of growth of the plant, almost regardless of structure of organs. Nature has set limits to the size which the several species attain that are seldom overcome by natural conditions of environment or by the nurture given by man. So, also, habit of growth serves to characterize species remarkably well. The upright, spreading, sprawling, drooping, dense, open, much-branched, or little-branched habit distinguish species so that one can hardly fail to pick out the types. Not so with varieties, however; neither size of plant nor its habit of growth serves greatly in the identification of varieties of either currants or gooseberries in any one species, as the plants of all are quite similar.

European and American gooseberries are

readily distinguished by habit of the plant, although it is sometimes difficult to separate hybrids between the two from one or the other species. European gooseberries are stocky with upright, straight branches, which curve but little and never assume the graceful slender, drooping, spreading, or sprawling habit of American varieties.

Constitutional characters.

Whether the plants make a rapid or slow growth, are long- or short-lived, bear annually or uniformly, characters important in determining varieties of tree-fruits, counts for little in classifying these fruits. Productiveness, however, is a most distinctive character in classification, always to be noted for its value in identification and because of its prime importance to the grower. Gooseberries and black currants, in particular, are exceedingly variable in productiveness.

Currants and gooseberries are the hardiest of fruits to cold, but are impatient of much heat, and both species and varieties show great variations in withstanding it. They vary somewhat, also, in relation to cold. The degree of hardiness to heat or cold is valuable in classifying, and of course determines very largely the value of species or varieties for the garden. English gooseberries, for example, stand but poorly the heat of American summers even in the North. The varieties of *Ribes petræum,* of which Prince Albert is the type, are less hardy to cold than varieties of *R. vulgare* or *R. rubrum.* None of the groselles withstands heat in regions where the orange or even the fig can be grown out-of-doors; nor do these fruits thrive in dry climates.

Immunity and susceptibility to diseases and insects vary greatly, and must always be noted for the information of the grower, and may sometimes serve in identification. The European gooseberry is extremely susceptible to a mildew which does little damage to varieties derived from the American species. Hybrids of the two species, even when the blood of the European plant is diluted to a second or third cross with the American species, show great susceptibility to this mildew. Species and varieties differ widely in resistance to San José scale, the currant worm, the currant borer, leaf-spot, anthracnose, cane-blight, and the pine blister rust, which at present is causing great consternation in America.

The wood.

The canes and branches vary greatly in species, as set forth in the descriptions of the several specific groups, and furnish some valuable clues to the identification of varieties. The height and diameter of canes, degree of smoothness, length of internodes, color, the character of spines and prickles in the gooseberry, the presence and character of pubescence and glands, the odor, the number of canes and suckers, are all important, and often furnish the chief diagnostic characteristics of varieties. Examples are: the stout shoots of the large-fruited currants of which Cherry is the type; the red shoots of Prince Albert and its related varieties; the exceedingly variable spines of gooseberries, which very often serve in identification. These characters, unimportant in determining the value of a variety, are often most useful in separating the different sorts. The winter-wood characters offer valuable distinguishing characters in color and markings of bark.

The spines help greatly in separating European and American gooseberries. European varieties bear from one to three light-colored spines at the base of the leaf, with occasionally smaller spines scattered along the stem. In American varieties the spines are shorter, usually borne singly, or are scattered irregularly along the stem. There are spineless varieties of both species, in which hair-like bristles may take the place of spines.

Leaves and leaf-buds.

The several species of Ribes are readily separated by characters of the leaves, as are hybrids of either currants or gooseberries. The most readily used characters are size, shape, and color, but pubescence, glands, dots on the lower surface, degree of smoothness, are all good distinguishing marks. The varieties of *R. vulgare,* of which the Cherry currant is the best representative, may usually be told by their thin, almost glabrous, yellowish-green leaves which are folded upward more or less; while *R. rubrum,* very similar, and its varieties are easily picked out by the thicker, softer leaves, very downy on the under surface. The time of falling of the foliage distinguishes *R. petræum* and its varieties, the Prince Albert currant being the type, as all of this group retain the foliage very late in the autumn. Looking at a currant plantation in the spring, one sees that there are great variations among varieties in leafing-time and in the color of the young foliage, characters which help greatly in classification; thus, Wilder starts into leafing earlier than any other currant. The leaves of some currants are bullate, that is blistered or puckered; this character serves to identify Prince Albert.

Buds of both leaf and flower are more or less distinct in species and varieties in size, shape, and color. A fine mark of distinction that can be used to advantage in identification in the winter is found in the angle taken by the bud; it may be appressed, that is pressed closely to the cane, or free, in which case it may stand nearly at right angles to the cane.

The margins may be serrate, dentate, or crenate, the character of the teeth offering valuable evidence in identifying all groups. The amount and character of pubescence on the margin serve as an aid in identifying some varieties. The margins of the leaves in several varieties take on a silvery tint, this character being quite pronounced in Ruby.

The length and thickness of the petiole is a good diagnostic character. The petiole of Victoria is remarkably long. The color must be noted and whether pubescent or glabrous. The petiole is channeled in some currants; this

PLATE XIV.—FAY CURRANT.

peculiarity helps to identify several varieties. The angle at which the petiole holds the leaf-blade is also a mark of distinction. Thus, the leaf of Prince Albert is held stiffly upright; that of Victoria, horizontally and somewhat lax; and in Fay the leaves point downward.

The leaves of all Ribes are more or less rugose, but the veins are more sunken and the spaces between more elevated in some varieties than in others. The degree of rugoseness is a particularly valuable mark in distinguishing gooseberries.

Flowers.

The flowers serve especially well in identifying currants, as they do also in gooseberries, but since varieties of gooseberries are much more readily identified by the fruit, a study of the flower is not so necessary as with the currant. In the three species of currants in which pomologists are interested, the flowers are very distinct and help to separate the varieties and to determine hybrids as well. The varieties of *R. vulgare* have a flat, open, green flower with a fleshy ring around the pistil, and the racemes hang down; in *R. rubrum* the flowers are more bell-shaped, without the fleshy ring; and in *R. petræum* the racemes are drooping, bearing flowers broadly campanulate and pink, purple, or claret red. The flowers of Red Dutch represent the Vulgare type; those of Ruby, the Rubrum; and those of Prince Albert, the Petræum type. The varieties of the three species differ materially in the time when the flowers open. The black currant and the golden currant, *R. nigrum* and *R. odoratum,* are told at a glance by size, color, and odor of the flowers, but there are but small differences to be discovered in the flowers of varieties of these species. There seem to be no reliable differences in the flowers of the two species of cultivated gooseberries.

Fruits.

Gooseberries, as a rule, are distinguished readily by their fruits. Varieties may usually be separated by the size, color, or shape of the berry, or by the many distinct flavors, the smoothness or pubescence of the surface, the texture and juiciness of the flesh, or the time of ripening. The fruits of European gooseberries are much larger than those of American sorts and more variable in size, as they are also in color and shape. In color, European gooseberries may be dark red, dull green, or clear yellow; or may have pale tints of these colors, while some are almost white. American gooseberries are green or red.

Varieties of black currants are also readily separated by their fruits. The several sorts vary greatly in size, color, and, more particularly, in flavor and odor. Each variety, also, has a season of its own to characterize it.

The red currants are much more difficult to separate by means of fruit-characters. Size and color help a little but often lead astray. Shape counts for little and flavor for still less. Such expressions as sour, subacid, and mild mean but little, because of the difficulty of comparing varieties at the same stage of maturity. The number of currants to the bunch is a fairly reliable character. The bunch may be large or small; loose or compact. The lengths of the fruit-stem and berry-stems are usually constant. Transparency of berry characterizes one or two varieties. The berries are held on one side of the stem in some varieties, and the bunches droop in some or stand out rather stiffly in others. The stems may be smooth or hairy. Skins vary in thickness, transparency, and smoothness. The flesh varies in texture and juiciness. Seeds offer no decided means of separation, although they vary a little in size, color, and number. Lastly, the time of ripening may be used as one of the safest characters. This enumeration would make it seem that currants might readily be picked out by their fruit-characters, but in practice the task is not easy and requires close study.

The accompanying description blank for the currant sets forth most of the characters students and fruit-growers will use in describing currants and gooseberries.

Species of currants and gooseberries.

Currants and gooseberries are modern fruits, for their domestication has taken place within the last four or five hundred years, despite which fact it is now difficult to make out how many species enter into cultivated varieties. That there is now but one species each for cultivated black currants and golden currants is certain, but some botanists place the red currants in one, others in two, and still others in three or four species. There is divided opinion, also, as to whether cultivated gooseberries belong to one, two, or three species, most botanists putting them in two. One of the most thorough pomological students of red currants, E. A. Bunyard, Maidstone, England, places red currants in three species, a classification followed here, although two others are mentioned as having entered into cultivated hybrids.

RED CURRANTS

Cultivated red currants, as has been said, come from at least three wild species, with the possibility that the blood of a fourth or fifth enters into some of the hybrid garden sorts. The species are: *Ribes rubrum, R. vulgare* and *R. petræum.* White currants are true albinos of the red species, *R. vulgare* furnishing most of the white varieties.

1. *Ribes vulgare,* Lam. Red Currant. Garden Currant. Upright shrubs attaining a height of 5 or 6 feet; young growth pubescent and slightly glandular. Leaves thin, cordate or subcordate, 3-5 lobed, with short-ovate, serrate lobes, yellowish-green, more or less folded upward, nearly hairless or pubescent only on the veins beneath, 3 inches across. Flower in long racemes, markedly drooping; rachis glabrous; pedicels filiform, glandless; calyx-tube yellow-green, saucer-shaped; sepals oval; petals narrowly cuneate; a high, narrow, fleshy ring between the stamens and the cleft style. Fruit a round, red or white, juicy berry, with the remnant of the calyx at the base.

DESCRIPTION BLANK FOR THE CURRANT

Name .... Plat..... Row..... Date..... 19....

PLANTS

Characteristics .....
Large, medium, small
Vigorous, medium, weak
Upright, spreading, drooping
Tall, medium, dwarf
Very productive, productive
Medium productive, unproductive

SUSCEPTIBILITY to
Insects .....
Diseases .....

SUCKERS
Numerous, medium, few, none

CANES
Stocky, medium, slender
Rough, medium, smooth
Long, medium, short
Straight, angular
Red, brown, green
Gray, dull, glossy

Internodes
Long, medium, short

LEAF-BUDS
Large, medium, small
Long, medium, short
Obtuse, conical, pointed
Plump, appressed or free

LEAVES
Large, medium, small
Roundish, cordate, oval
Ovate, obovate, wedge
Abruptly pointed, taper-pointed
Number of lobes .....
Lobes deep or shallow
Wide, medium, narrow
Long, medium short
Light, medium, dark green
Glossy, dull
Rough, medium, smooth
Pubescent.....glabrous

Margin
Crenate, serrate, hairy

Petiole
Long, medium, short
Thick, medium, slender
Color .....

FLOWERS
Date of bloom .....
Early, medium, late
Large, medium, small

Sepal
Bell or saucer-shaped
Red, green, purple, yellow

Receptacle red, green
with or without fleshy ring

FRUIT

Characteristics .....
Early, midseason, late

DATE OF RIPENING .....

LENGTH OF SEASON .....

PICKING QUALITY .....

KEEPING QUALITY .....

SHIPPING QUALITY .....

SUSCEPTIBILITY to
Insects .....
Diseases .....

CLUSTERS
Long, medium, short
Compact, loose
Well filled or not
Lax or held out stiffly

CLUSTER-STEMS
Long, medium, short
Thick, medium, slender

BERRIES
Numerous, medium, few
Large, medium, small
Uniform, variable
Black, red, whitish, dull, glossy

SKIN
Thick, medium, thin
Opaque, translucent

FLESH
Juicy, medium, rather dry
Colorless, pinkish
Firm, melting, seedy
Sweet, subacid, sour
Sprightly, aromatic

Quality
Best, very good, good
Fair, poor, very poor

USE
Dessert, kitchen
Market, home

DESIRABILITY .....

REMARKS .....
.....
.....

The species has been divided into several botanical varieties, but pomologists are interested only in the type species and var. *macrocarpum,* Jancz. This variety differs from the type in its irregular growth, due to the fact that the lateral branches often have blind terminal buds; larger leaves, more deeply cordate, with a very large middle lobe; racemes usually without leaves at the base; and larger fruits. To this botanical variety belong the large-leaved and large-fruited sorts of which Cherry is typical. The Macrocarpum currants are more tender to cold than the garden sorts belonging to *R. vulgare.* From this species come most of the cultivated red currants.

Ribes vulgare is a native of western Europe, being found wild in Great Britain, France, and Belgium. It is a fruit of cold and temperate regions, and its culture was not attempted in the warmer parts of Europe; therefore the species was not domesticated until agriculture was well advanced in northern and western Europe. Its culture was no doubt begun in the fourteenth or fifteenth century; at any rate, it is mentioned as a commonly cultivated fruit in the garden books of the sixteenth century, and not mentioned previously as a garden plant. This currant was brought to America by the earliest settlers in New England.

2. *Ribes rubrum,* Linn. Northern Red Currant. Upright shrub attaining a height of 6 feet; young growth less pubescent than in *R. vulgare.* Leaves rarely subcordate, 3-5 lobed, usually tomentose beneath; larger and thicker than those of *R. vulgare* and held more laxly, 5 inches across. Flowers greenish or brownish, in spreading racemes, borne on rather stiff, short pedicels on one side of the bunch, whereas those of Vulgare swing freely around the bunch; held out at right angles from the stem, those of *R. vulgare* being pendulous; calyx-tube more bell-shaped than in *R. vulgare* and without the ring inside. Fruits usually red, juicy, with the remnants of the flower at the base. It is not always easy to distinguish this species from *R. vulgare.*

Janczewski, now the recognized authority on the botany of the currant, describes several botanical varieties, of which var. *pubescens,* Schwarz, and var. *scandicum,* Hedl. are given by pomological students as progenitors of cultivated varieties. Several natural hybrids between this and the preceding species are named, and from it come most of the small-fruited, hardy garden varieties, either as pure-breds or as hybrids with the two other species under cultivation.

This species is a native of central and northern Europe and Asia eastward into Siberia and Manchuria. How, where, and by whom the species was domesticated is not known. It is rather less promising in the wild than *R. vulgare;* there are fewer varieties showing its blood; and since it is not found in regions which came so early under agriculture as those in which *R. vulgare* grows wild, it is safe to say that *R. rubrum* came under cultivation at a later date.

3. *Ribes petræum,* Wulfen. Stout, upright shrubs attaining a height of 7 feet; shoots usually reddish and glabrous; bush larger than in the other two species. Leaves roundish, subcordate, stout, 3-lobed, middle lobe longest, acute, very dark green, usually puckered or blistered, rugose, 3-4 inches across. Flowers in rather dense racemes, appearing later than those of the other two species, pink or red to claret red; pedicels short; bracts very small; calyx-tube broadly campanulate, with short, rounded, ciliate sepals; petals nearly half as long as sepals, with a callosity below the base. Fruits more acid, darker red and ripening later than those of *R. vulgare* and *R. rubrum.*

Several botanical species are distinguished from which garden varieties, it is generally agreed, come; of one of which var. *bullatum,* the well-known Prince Albert is typical This species comes from the mountains of central and southern Europe, north Africa, Caucasus and from northern Asia.

The currant does not seem to have early attracted the attention of gardeners, although it must have been seen by civilized men long before the Christian era. It began to be pictured and described accurately enough in the herbals by the middle of the sixteenth century, so that it can be said that its domestication dates from about that time. Seedling currants were grown as early as that century, we are told, and no doubt the hybridization of this species with the other two began through natural means as soon as the three types were grown in the same gardens.

The red currants of the present are a mixture of these three species. The relative importance of each in the making of garden varieties can be determined only by careful analysis of plants from selfed seed. In such an analysis the possibility of mutations must be kept in mind.

BLACK CURRANTS

White currants and striped currants are but closely related strains of red species; black currants are quite distinct, belonging to a species as closely related to the gooseberry as to the red currant. Possibly the relationship is closer, since the black currant intergrafts and hybridizes with the gooseberry, while it has not been found that it will do so with the red currant. Black currants are used for medicinal purposes and in cookery, but are little liked as a dessert fruit. The black currant is held in high esteem in Great Britain and parts of western Europe, but has never found favor in America, possibly because of the bitter taste and aroma, described by an old herbalist as "of a stinking and somewhat loathing savour." There are several species of currants with black berries, but only one, *R. nigrum,* is commonly cultivated.

4. *Ribes nigrum,* Linn. Black Currant. Stout, upright shrub attaining a height of 8-10 feet; stem, foliage flowers, and fruits having a strong unpleasant odor. Leaves cordate, 3-5 lobed, more or less pubescent and bearing resinous dots beneath; margins serrate; lobes broad, irregular, acute. Flowers borne in loose racemes; calyx-tube broadly campanulate; petals greenish-purple or dull whitish, half as long as sepals; calyx and ovary pubescent and glandular. Fruits round or sub-globose, ⅓ inch in diameter, black, with a strong odor and taste.

Botanists describe several natural varieties, one with yellow, another with green fruits. There are also botanical varieties with cut

leaves, and still others with variegated foliage. None of these botanical divisions is of especial interest to pomologists, who are concerned only with a dozen or more horticultural varieties derived from the type species.

This black currant is a native of Europe and north and central Asia. The American black, *R. americanum,* is similar to *R. nigrum* in plant and fruit, but differs much in the flower; it is found from Nova Scotia to Virginia and westward to the Rocky Mountains, furnishing wild fruit to those who care to pick it. Were it not for the cultivated black currant from Europe, this native species might well be domesticated. The European black currant is a fruit of modern times, its culture dating back not more than two centuries. The more northern the latitude, the higher the esteem in which it is held.

GOLDEN CURRANT

5. *Ribes odoratum,* Wendl. Golden Currant. Buffalo Currant. Missouri Currant. A spineless shrub attaining a height of 10 feet, young branches pubescent. Leaves 3 to 5 lobed, coarsely dentate, glabrous, ovate, rarely cordate, 1-3 inches broad; petioles pubescent, shorter than the blade. Flowers golden yellow, fragrant, borne in 5-8 flowered racemes; tube ½ inch long, stout; sepals half as long as the tube, spreading or revolute; petals half as long as sepals, more or less red. Fruit round or ovate, yellow or black, ⅓ inch in diameter.

The habitat of this species is banks of streams, from Minnesota to Missouri and Arkansas and westward. The golden currant is just coming under cultivation, but one variety, the Crandall, introduced in 1888, being commonly found in gardens. Three or four other sorts of less repute are occasionally to be found.

GOOSEBERRIES

6. *Ribes Grossularia,* Linn. European Gooseberry. An upright, or spreading, seldom drooping shrub 2-4 feet high; spines many, mostly in 3's, variable in length and stoutness, sometimes bristly. Leaves cordate to broadly cuneate, pubescent or glabrous, rather thick, 1-3 inches broad, crenate or dentate, 3-5 lobed. Flowers solitary, rarely 2; ovary pubescent or often glandular; calyx-tube campanulate, its lobes oblong, pubescent; styles pubescent. Fruit ½-1 inch in diameter, round, ovate, or oblong, smooth or pubescent, sometimes glandular or bristly, green, yellow or red.

The original form of the cultivated European gooseberry is found in Europe, North Africa, and the Caucasus. In this vast region there are several botanical varieties, but the cultivated gooseberries seem to have been derived from the type form. While cultivated somewhat on the continent, this fruit belongs almost wholly to Great Britain, where several hundred varieties have been introduced in England, Wales, Scotland, and Ireland. There are but few places in America where the species thrives, as the climate is uncongenial and the gooseberry mildew proves a veritable scourge. There are now, however, a number of hybrids between this species and the American gooseberry which promise much for American pomology.

The gooseberry is not mentioned by ancient agricultural writers, and seems to have first come into prominence as a cultivated plant in England. Tusser, the farmer-poet, mentions it in 1557. Turner, the English herbalist, writes of it in 1573; as does Gerard in 1597; and Parkinson, in 1629, names eight varieties. For the last two hundred years, the gooseberry seems to have been the fruit of fruits in England, and many societies have been organized to bring it to its best estate, and many voluminous articles and books have been devoted to its culture.

7. *Ribes hirtellum,* Michx. American Gooseberry. A shrub 3-5 feet high; branches slender, drooping, unarmed or armed with small spines at the base of shoots or with few or many whitish prickles. Leaves broader than long, rather thin, 1-2 inches broad, dentate or crenate-dentate, cuneate at the base, incisely 3-5 lobed, more or less pubescent underneath, with some glandular hair on the petiole. Flowers 1-3, borne on very short peduncles and pedicels; ovary glabrous; calyx-tube campanulate; sepals greenish or purplish, glabrous; petals whitish, half as long as sepals; style pubescent. Fruit ½ inch in diameter, round, ovate, or oblong; skin smooth; greenish, purple or black.

This species is found wild from Newfoundland to Maryland and West Virginia, and westward nearly to the Rocky Mountains. There are several American garden varieties which are undoubtedly pure-bred varieties of this species, of which Pale Red is best known. Downing and Houghton, leading varieties of gooseberries, are hybrids between this and the European species. Until recently it was thought that *R. oxyacanthoides,* Linn., was the parent of the score or more American gooseberries, but these are now all put in this species, or as hybrids of this and the foregoing, with a few exceptions to be noted. *R. Cynosbati,* Linn., *R. inerme,* Rydb., *R. setosum,* Lindl. and *R. missouriensis,* Nutt., are all represented, either as hybrids or pure-breds, among American gooseberries. These and possibly still other native species offer much for the plant-breeder. All of the native species named should be hybridized with the European gooseberry, which bears a much larger, handsomer, and better-flavored fruit, in order to produce varieties capable of withstanding the varied climate and soil conditions of the several native species.

Wild gooseberries were used by the Indians before Europeans came to the New World, as they are now by the tribes in the West and North. Trappers and early settlers have always used the fruit. But, while the first settlers from England brought the European gooseberry with them, only to fail in its culture, none tried the native species in the garden until the nineteenth century was well advanced. In 1833, Abel Houghton, Lynn, Massachusetts, planted several English varieties near a plant from the woods. Seeds were saved from fruit of this native, and from it came the Houghton, which, however, was not disseminated until 1848. The domestication of the native gooseberry has, therefore, taken place within less than one hundred years.

CHAPTER XIX

VARIETIES OF CURRANTS

The currant does not thrive in hot, dry weather, and is, therefore, a fruit of northern climates, having commercial importance only in regions where the grains are profitably grown. On the other hand, it endures a more austere climate than other bush-fruits, for which reason, and because of earliness, sprightliness, and healthfulness of the product, the currant plays an important part in the pomology of northern climates: no less than 70 red, 14 black and 5 golden currants have been grown at one time or another in the United States and Canada. Of these, 26 red currants, 6 black, and 2 golden currants are still prominent in American pomology, and are described in this text. Compared with other fruits, these numbers seem small, but currants are relatively stable, and improved varieties are obtained only with difficulty, so that the several species are represented by but few varieties.

The botanical classification of the preceding chapter, accepted by botanists, is based upon distinctions so fine that pomologists will find it difficult to place cultivated varieties of red currants in the several species. Thus it is impossible to make sure whether some varieties belong to *R. vulgare* or *R. rubrum*. Classification is further complicated by the crossing of varieties from the several species, and by great confusion of names in nursery and garden practices. Until a thorough study can be made of varieties of red currants, the prime requisite of which is to make certain that all are true to name, attempts to place them in species are not worth while. The author is forced to be content with putting all red currants in one group, black sorts in another, and the golden currants in a third.

CHAUTAUQUA. *Chautauqua Climbing.* The tall spreading growth of this variety led to its being introduced as a climbing currant. The plants are vigorous, healthy, and very productive. The clusters are long, with stems free from berries at the base, and therefore easy to pick. The berries are large, handsome, light red, high in quality, and hang long after ripening. It is a mediocre variety with little to recommend it for commercial plantations, but sometimes desirable, by reason of its spreading plants, for trellises or fences in home plantations. Chautauqua is a chance seedling found in the woods by R. F. Lonnen, Marville, New York, about 1893.

Plants large. vigorous, upright-spreading, dense, productive, healthy; suckers rather few; canes stocky, smooth, straight, dark brown, often overlaid with dull gray. Leaves ovate, thin, dark green; margin crenate; petiole averaging about two inches, pubescent; season of bloom early. Fruit matures early in July, easily picked; clusters long, loose, with 15-24 berries to a cluster; stems and pedicels long, slender; berries adhere well, medium to large, often ½ inch across, roundish to slightly oblate, attractive light bright red; skin smooth, thin, tough, translucent; flesh reddish, medium juicy, fine-grained, tart, sprightly; very good; seeds intermediate in size and number.

CHERRY. Fig. 260. This old variety is one of the most popular currants for home and market in America. Bunches and berries are large, and, as they are borne on vigorous plants, the variety becomes one of the most productive of the large-fruited currants. The berries are a beautiful bright red, very large, though not always uniform in size, and well flavored. Defects are that the plants do not sucker freely, so that the bushes sometimes have too few stalks; there is a tendency in the canes to "go blind," that is, to lack the terminal shoot; and the short-stemmed bunches are borne so close to the wood that the crop is hard to pick. The variety seems to have originated in Italy, thence it came to France about 1840, and from France was introduced into America by W. W. Falk, Flushing, Long Island, in 1846.

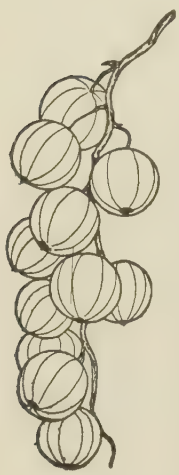
260. Cherry. (×⅔)

Plants large, vigorous, upright-spreading, dense, productive; suckers few. Leaves cordate, lobes ovate, rugose, pubescent, margin crenate; petiole 2 inches long. Flowers early, *R. vulgare* type. Fruit early; clusters short, thick, loose, 10-14 berries; stem short, making fruit difficult to pick; berries very large, cling well, round, dark red; skin smooth, tough, transparent; flesh red, medium juicy, firm, mild subacid; quality good; seeds large, rather numerous.

COMET. This variety is listed by several American nurserymen as distinct, but all who have compared it with Fay say the two are very similar or identical. The variety came from England twenty-five years or more ago. It is possible that after the introduction of Fay, an American variety, into England it was renamed Comet.

DIPLOMA. Fig. 261. Diploma is a new currant rather widely grown in New York, but still on trial in other currant-growing regions.

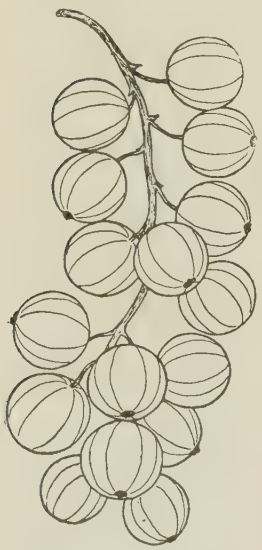
The variety is easily distinguished by its light red fruits, which are more transparent than those of any other currant, the seeds and segments showing distinctly through the thin skin. The fruits are juicier than those of most other currants, therefore especially desirable for jellies; for the same reason the crop must be picked and handled with care. The flavor is mild—almost sweet. Diploma originated with Jacob Moore, Brighton, New York, in 1885.



261. Diploma. (×⅔)

Plants large, vigorous, upright-spreading, dense, hardy, productive, healthy; canes numerous, stocky, long, somewhat angular, reddish-brown; blooms in midseason. Fruit midseason, period of ripening short; pedicels of average length and thickness; berries large, round, adhere tenaciously to the pedicels, bright, light red which changes but slowly after picking; skin very thin, very transparent, the segments, veins and seeds unusually distinct; flesh semi-transparent, tinged with red, tender, very juicy, sprightly subacid becoming mild; quality good to very good; seeds numerous, large.

EVERYBODY. This is one of the newest red currants, and is recommended as succeeding "everywhere and on all soils." On the grounds of the Experiment Station, Geneva, New York, it is not more remarkable than the average variety, although the medium-sized, dark-red currants of high quality recommend it. The foliage hangs late in the fall, and the currants remain on the bush long after ripening. It is very similar to Filler, an older variety. Everybody was introduced by J. T. Lovett, Little Silver, New Jersey, in 1914.



262. Fay. (×⅔)

Plants of medium size, sprawling habit, not very productive, healthy. Leaves of medium size, base very deeply notched, lower surface a peculiar olive-green. Flowers midseason, green with a tinge of brown. Fruit midseason; clusters compact, 12-15 berries; berries round, cling well, medium to large, dark red; flesh firm, rather dry, subacid; quality good; seeds medium in size and number.

FAY. Fig. 262. *Fay's Prolific.* All agree that Fay is one of the best of the large-fruited red currants. Clusters and berries are large and very uniform in size, making a most attractive product. The cluster-stems are long, therefore harvesting is easy. The berries are dark-red, sprightly, juicy, and thin-skinned, qualities that make the fruit one of the best for canning and jellies. The bushes are not large, and the yield is not so heavy as with some other varieties, unproductiveness being the chief defect. Fay originated in 1868 with Lincoln Fay, Portland, New York.

Plants of medium size and productiveness, healthy, sprawling in habit. Leaves large, very rugose, pointing downward, olive-green. Flowers early, green tinged with red. Fruit early midseason; clusters large, 12-15 berries, loose, with long stem, uniform; berries cling well, large, round, rather dark red; flesh reddish, firm, juicy, subacid; quality very good; seeds small, rather numerous.

FILLER. *Scarff.* Although long past the probationary period, Filler is little grown except in the Hudson River Valley in New York, where at one time it was a favorite but is less grown now. The plant is not above mediocre in productiveness, nor the fruit in appearance and quality. The bushes sprawl on the ground to the great detriment of the currants, and to the vexation of the cultivator. Filler originated at Marlboro, New York, about 1890, in the garden of George Filler.

Plants rather dwarf, sprawling, not very productive. Leaves on bearing branches very small, base deeply notched, milky-green. Flowers open in midseason. Fruit midseason; clusters compact, 12-15 berries; berries round, somewhat oblate, medium to large, dark red, variable in size; flesh firm, not very juicy, subacid; quality good; seeds large, numerous.

FRANCO-GERMAN. On the grounds of the Experiment Station, Geneva, New York, Franco-German apears to be identical with Prince Albert. It is listed by several nurserymen as distinct, but the differences do not appear in any of the descriptions. The variety is said to be particularly desirable for dry, hot climates. The origin of the name is not known.

GIANT RED. This is a new currant with a reputation yet to make in commercial plantations. On the grounds of the Experiment Station, Geneva, New York, it is surpassed by several older varieties of its type, that of Versailles, of which it is a seedling. Giant Red was grown by E. P. Powell, Clinton, New York, from seed planted in 1895, the variety being introduced in 1912.

Plants very tall, upright, productive, healthy; canes stout. Leaves large, milky-green, thick, held nearly flat. Flowers midseason, slightly tinged with red. Fruit midseason; clusters of medium length, compact, well filled to the end; stems long, making picking easy; berries medium to large, bright red; flesh firm, medium juicy, sour, too acid for pleasant eating; seeds large, numerous.

HOLLAND. *Long-bunched Holland.* This variety seems to be grown rather commonly in the Middle West and somewhat in the Pacific states. As grown at the New York Experiment Station, Geneva, New York, it is similar

or identical with Prince Albert, and it is possibly that old sort renamed. Its history is not known.

KNIGHT'S LARGE RED. *Knight's Improved. Pomona.* Knight's Large Red, Knight's Improved, and Pomona are hopelessly confused. The three names are interchanged for the same variety, and at least a half-dozen distinct currants bear the names. It is now impossible to select the true type. There are better currants than any that pass under these names.

LONDON MARKET. *Scotch.* London Market is considered the best red currant in many parts of the Middle West. Its chief commendatory characters are ability to withstand hot, dry weather, and resistance to currant borers and currant diseases. It is said to be also the most resistant of all red currants to the pine blister rust. At Geneva, New York, however, the foliage is very susceptible to the currant aphis. The history of the variety is obscure; it is several times mentioned as an English variety imported in 1878. It is possibly the Scotch of Great Britain.

Plants tall, upright, vigorous, fairly productive. Leaves small, thin, light green, late in opening, very abundant. Flowers open in midseason. Fruit late; clusters long, medium compact, tips well filled, 12-20 berries; berries of medium size, variable, round-oblate, dark red; flesh red, firm, juicy, sprightly; quality good; seeds medium in number, large.

MAGNUM BONUM. This variety on the grounds of the New York Experiment Station, Geneva, New York, is very similar to Versailles or identical with it. That the two are alike or the same has been noted in other plantations both in America and England. While the variety was imported from England as long ago as 1850, it is believed that the currant at Geneva is the Magnum Bonum of the original importation.

NORTH STAR. This is a comparatively unimportant currant, grown for about thirty years, which is finding less and less favor. The small size of the bunches and berries, both of which are variable in size, and the indifferent quality of the fruit are against it. The variety is reported as rather widely grown in the northern part of the Mississippi Valley. It was introduced by the Jewell Nursery Company, Lake City, Minnesota, about 1885.

Plants large, vigorous, rather spreading, dense, medium productive; suckers numerous. Leaves very early, large, dark green, rugose; margins nearly serrate; petiole short. Flowers early. Fruit very early; clusters medium in length, poorly filled, loose; stems and pedicels long; berries small, cling well, round, red; skin smooth, thin, translucent; flesh red, juicy, fine-grained, sprightly; quality very good; seeds few, medium in size.

PALLUAU. *Fertile de Palluau.* This variety, offered by several western nurserymen as especially desirable for dry, hot climates, is probably Red Dutch; if not identical, the two are so similar that the description of Red Dutch answers for Palluau. The variety is supposed to have come to the United States from France in the middle of the last century.

PERFECTION. Fig. 263. Although Perfection is a new currant it is well known and is being disseminated rapidly in New York and parts of the Northwest. The outstanding characters of the plants are vigor, hardiness, healthfulness, and productiveness; of the fruit, large clusters of uniformly large berries borne on a long stem, so that picking is easy. The berries are bright, clear red, and are as pleasing in flavor as those of any other variety, and superior to those of most other currants. The fruit is borne on the old wood in a manner peculiar to the variety. Perfection originated with Charles G. Hooker, Rochester, New York, in 1887.

263. Perfection. (×⅔)

Plants large, vigorous, upright-spreading, hardy, productive, healthy; branches stocky, smooth, long, straight, numerous, brownish, dull and with little red; foliage deep green, healthy; season of bloom early. Fruit midseason; very easily picked, ships well; clusters long, compact, cylindrical, slightly tapering; stems long, of medium thickness; pedicels short, thick; berries roundish, uniformly large, cling well to the pedicels, bright handsome red; skin thin but tough; flesh juicy, tender, sprightly subacid; quality good; seeds intermediate in size and number.

PRINCE ALBERT. *Rivers' Late Red.* Prince Albert is an old European currant grown under many names, but best known by English-speaking peoples under the two here given. Wherever known, it is valued for its very late fruits, which are of large size, have thin skins and a most pleasing piquancy of flavor. The bushes are vigorous and upright, but only moderately productive. The fruit is well liked by canners and in the home for preserves and jellies. The variety is one of the latest to flower as well as to ripen its fruits.

Plants large, vigorous, upright-spreading, very dense. medium productive; suckers of medium number; canes tall, rather slender; young shoots tinged red. Leaves cordate, taper-pointed, dull green, very rugose; held stiffly upright; petiole 3 inches long, pubescent; flowers late. Fruit very late; clusters long, well-filled; stems and pedicels short; berries cling well, of medium size, round-oblate, bright red; skin thin, smooth, tough, translucent; texture firm, juicy; flavor sour, highly flavored; quality good for dessert purposes; seeds of medium size, numerous.

RED CROSS. This variety is hardly above the ordinary, and is excelled by several others of the large-fruited currants. Moreover, in the Hudson River Valley, where it was at one time rather largely planted, the berries crack

badly. Red Cross originated with Jacob Moore, Attica, New York, in 1894.

Plants large, vigorous, spreading, dense, fairly productive. Leaves large, milky-green, held nearly flat. Flowers midseason; type of *R. vulgare*. Fruit midseason; cluster of medium length, tips filled poorly; berries large, round, bright red; flesh red, juicy, flavor mild subacid; quality good; seeds large, numerous.

RED DUTCH. Fig. 264. Red Dutch is one of the oldest and best known red currants, now generally discarded in eastern commercial plantations, but still largely grown in the Middle West. It has many synonyms, but in the present confused state of currant nomenclature it is impossible to name these with certainty. The type is well established, however, and there should be little difficulty in identifying the true Red Dutch. The variety is passing from cultivation by reason of the small berries, which, however, are excellent in quality. This is an old European sort, the history of which is lost.

264. Red Dutch. (×⅔)

Plants large, vigorous, upright, very productive; canes and shoots slender. Leaves rather large, dull green, soft, hairy beneath. Flowers midseason, of *R. rubrum* type. Fruit early; cluster long, slender, 10-18 berries, cling well, small, round, bright red; flesh red, juicy, firm, sprightly; quality of the best; seeds medium in size and number.

RUBY. *Moore's Ruby.* Although introduced but a few years ago, two currants are now sold under this name, one an early and the other a late sort. Plants on the grounds of the New York Agricultural Experiment Station, Geneva, New York, secured from the originator, Jacob Moore, Attica, New York, show the early sort to be the true Ruby. Neither fruit nor plant recommends the variety very highly. It was introduced about 1895.

Plants dwarfish, upright, medium in vigor and productiveness. Leaves rather large; upper surface yellow-green; lower surface milky-green, pubescent. Fruits early; clusters short, tips well filled, 10-12 berries; berries of medium size, uniform, round, dark red; flesh firm, medium juicy, rich, sprightly; quality very good; seeds numerous, medium in size.

VERSAILLES. Long a standard, Versailles is now giving way to newer and better currants. Lack of productiveness is the chief reason for its passing out and, also, there are other large-fruited sorts, of which this is a form, with larger and more uniform clusters and berries of better quality. There is much confusion in the group of currants to which Versailles belongs, and it is almost impossible to distinguish Versailles from Cherry, another representative of the group. As grown at the Geneva Experiment Station, Geneva, New York, Versailles has a long bunch, darker fruit, and less tendency to "go blind," that is, to lack the terminal bud. Versailles is also confused with several other varieties and has many synonyms. It is an old European sort brought to America more than a half-century ago.

Plants large, vigorous, upright, not very productive; shoots stout, easily broken, many "blind." Leaves large, milky-green, held nearly flat. Flowers early, *R. vulgare* type. Fruit midseason; clusters of medium length, 8-12 berries, well filled to tip; berries medium to large, round, dark red; flesh firm, juicy, red, mild subacid; quality good; seeds rather numerous, large.

VICTORIA. Fig. 265. *Raby Castle.* This variety, rather widely grown in Canada and the United States, is, without doubt, Raby Castle, an old English currant not known under that name on this side of the Atlantic. Its small berries condemn it for commercial plantations. The plants are very vigorous and productive; the fruit is of excellent quality, and keeps longer on the bushes than that of any other variety. It is said to be rather more resistant to currant borers than other varieties.

265. Victoria. (×⅔)

Plants very large, upright, vigorous, healthy and productive. Leaves large, yellowish-green, thick, soft, under surface very pubescent. Flowers midseason, sepals tinged with red, *R. rubrum* type. Fruit late midseason; clusters short to medium, filled to the tip, 10-20 berries; stem yellow, downy; berries cling well, held on stem to one side, small to medium, round-oblate, bright red; flesh red, firm, juicy, rather too sour for dessert; quality fair; seeds large, rather numerous.

WHITE DUTCH. Fig. 266. This is a very old sort grown under at least a dozen names and badly confused with other white currants. The fruits are about the earliest and sweetest white currants, characters which help to distinguish the variety; they are a little darker in color than those of White Grape, with which White Dutch is often confused. Unfortunately, the berries are not very large and are not uniform, to offset which fault they are most excellent in quality. White Dutch is an old European currant, the history of which is not known.

266. White Dutch. (×⅔)

Plants vigorous, upright-spreading, very productive; suckers numerous. Leaves cordate, taper-pointed, rugose, pubescent, with margins nearly serrate; petiole 2½ inches long; flowers midseason. Fruit early; clusters short, medium com-

pact, tips poorly filled, with berries small to medium, cling well, round-oblate, yellowish-white; skin thin, smooth, tender; flesh white, rather dry, fine-grained, mild subacid, almost sweet; quality excellent; seeds small, rather numerous.

WHITE GRAPE. *White Antwerp.* White Grape is distinguished by having the largest cluster and berry of all white-fruited currants. The quality of the fruit is not so good as that of White Dutch, being sourer and not so rich. Because of its handsome fruits and fill-basket qualities, it is the best commercial variety of the white currants. Its history is unknown, except that it came from Europe and has long been grown in America. There are several synonyms, the nomenclature being in a bad state of confusion.

Plants of medium size and vigor, spreading, sometimes sprawling, productive; canes and branches rather slender. Leaves of medium size, thick, soft, pubescent on lower surface, yellowish-green. Flowers midseason, *R. rubrum* type. Fruit midseason; clusters long, tips filled poorly, loose, berries 8-16; berries large, round-ovate, clear translucent white, not creamy as is White Dutch; flesh firm, juicy, subacid; quality good; seeds large, numerous.

WHITE IMPERIAL. The fruits of White Imperial are rated as best in quality of all currants. The rich, almost sweet flavor, makes it a choice dessert fruit. The plant-characters are not so good as those of several other white varieties, and the currants are not so attractive in appearance. The history of the variety is not known, except that it was sold and strongly recommended by the late S. D. Willard, Geneva, New York, beginning about 1890.

Plants rather small, spreading, medium in vigor and productiveness. Leaves and flowers of the *R. rubrum* type; flowers midseason. Fruit midseason; clusters medium to long, well filled to the tips; fruit-stems long, making easy work in picking; berries medium to large, creamy white, roundish; flesh firm, juicy, sweet, rich; quality excellent; seeds medium in size and number.

267. Wilder. (×⅔)

WILDER. Fig. 267. *President Wilder.* Wilder is a red currant of the Versailles type, being a seedling of that sort, which it greatly surpasses in vigor, productiveness, and size and appearance of fruit. In the great currant regions of New York, Wilder is now the favorite variety, and in the race for commercial supremacy continues to increase the lead it now holds. The fruits are exceptionally handsome, higher in quality, and hang longer after ripening than those of any other commercial sort. A fault is that the fruits are not always uniform in size. Wilder originated with E. G. Teas, Irvington, Indiana, about 1878.

Plants large, upright-spreading, vigorous, healthy, productive. Leaves large, nearly flat, milky-green, thick. Flowers early, *R. vulgare* type. Fruit late; clusters long, compact, tips filled rather poorly; fruit-stems long; 8-10 berries; which are large, variable in size, round-oblate, dark red; flesh red, firm, juicy, mild subacid; quality good; seeds large, numerous.

VARIETIES OF BLACK CURRANTS

BALDWIN. This black currant is listed in European catalogs and is offered occasionally by American nurserymen. European writers say that it is the earliest black currant to leaf, and that the fruit is not so strong in flavor as that of other black currants. Beach of Geneva, New York, described the variety in 1895 as follows:

"Bush moderately vigorous, and productive. Fruit varies from small to large, averaging medium size. Flavor milder than that of Common Black. It is several days later than Common Black in ripening."

BLACK GRAPE. *Ogden's Black Grape.* This is an old English currant introduced in America about 1885. In England, it is strongly recommended for a market sort because of its vigorous, productive bushes and its large, sweet berries. In America, it was reported in 1895 on the grounds of the New York Agricultural Experiment Station as vigorous but unproductive, and as producing fruits which varied from large to small, with strongly flavored acid pulp.

BOSKOOP GIANT. Fig. 268. In England, where this fruit is much more highly esteemed than in America, Boskoop Giant is rated as quite the best all-round black currant. The characters which recommend it are very large, sweet, richly-flavored berries, and vigorous, productive bushes. The plants flower late, but the fruit ripens early. The crop can be gathered at one picking, and the berries hang long on the bushes after ripening. The variety was imported into England from Holland in 1896, by George Bunyard & Co., Ltd., Maidstone, and was soon after brought to America by several nurserymen.

268. Boskoop Giant. (×⅔)

Plants large, vigorous, upright, productive; canes numerous, rather slender. Leaves large, dull green, with numerous, aromatic glands on the under surface; margin coarsely serrate; petiole short. Flowers late. Fruit midseason; clusters large, loose, not well filled; stem long, glandular; berries 8-14, large, cling well, round, black; skin glandular, thin, opaque; flesh greenish, tinged red at skin, fine-grained; juicy, rich and sweet, aromatic; quality excellent; seeds small, numerous.

CHAMPION. This black currant has long been grown in New York, where it is liked for its vigorous, productive bushes and large, mild-flavored currants. It seems to have been brought to the United States from England about 1880, but how long it was cultivated in the Old World does not appear

Bushes large, vigorous, spreading, productive; canes numerous, rather slender. Leaves large, dull green, pubescent, resinous on the under side; margins hairy, coarsely serrate. Flowers late. Fruit late; clusters rather short, loose, tips well filled; berries 6-10, cling well, medium to large, round, black; skin opaque, glandular, thin; flesh firm, rather dry, yellowish, tinged red at the skin, sprightly, rich, aromatic; quality very good; seeds small, numerous.

COMMON BLACK. *Black English.* This is an old black currant now little grown, although listed in several catalogs. It is probable that three or four varieties are sent out under this name. At the State Experiment Station, Geneva, New York, the bushes are of spreading habit, vigorous, and productive, and bear fruits of medium size, which are rather too acid, too strongly-flavored, and ripen too unevenly to be desirable.

269. Naples. (×⅔)

NAPLES. Fig. 269. *Black Naples.* An old variety, long a standard in Europe, Naples is being discarded abroad, but is still one of the commonest black currants in America. It should give way to better sorts on this side of the Atlantic, as the fruits are exceedingly variable in size, the clusters small, and the flavor rather too strong to be pleasant. It is mentioned by Kenrick as a new importation to America in 1832.

Plants large, very dense, vigorous, rather unproductive. Leaves rather large, light green, appearing very early. Flowers very late, strong disagreeable odor. Fruit latest of all black currants; clusters short, 4-10 berries, tips well filled; berries small to large, variable, round, black; pedicel with one or two bracts where attached to berry; skin glandular, thick, tough; flesh greenish, juicy, tart, strongly flavored, aromatic; quality fair; seeds small, numerous.

VARIETIES OF GOLDEN CURRANTS

CRANDALL. Crandall is the sole representative of *R. odoratum* widely distributed throughout the country, being a familiar inhabitant of dooryards and parks as an ornamental. The tough skin and unpleasant flavor condemn it as a garden plant. The variety is often sold under the name Flowering Currant. There is said to be a productive strain on the market.

Plant 8 feet in height, very vigorous, hardy, unproductive. Leaves roundish cordate, 3 inches broad, thin, pubescent on both surfaces; margins coarsely serrate; petiole short, slender. Flowers late, yellow, few; pedicels short, pubescent, green. Fruits borne in clusters of 1-5, drop when ripe, ½ inch in diameter, round-oblate, black, glossy, smooth; flesh greenish-yellow, rather dry, sprightly, very aromatic; quality fair; seeds many.

DESERET. Deseret, Golden, and Jelly are other named sorts of the golden currant which occasionally appear in catalogs from the Middle West and Rocky Mountain regions, where the Europeans grow but poorly or not at all. No one of the three is as worthy of cultivation as Crandall. They are most commonly grown in Utah, and probably originated in that state.

CHAPTER XX

VARIETIES OF GOOSEBERRIES

Compared with European varieties, American gooseberries are far from perfect. This fruit has been much neglected by fruit-growers and nurserymen in this country. A well-ripened gooseberry is one of the most delectable of fruits, yet the American people have had little opportunity to become acquainted with the ripe product, as fruit-growers in this country nearly always send the crop to market in the green state. Neglect takes another turn. With curious persistence, in the light of their own interests, fruit-growers and nurserymen insist on growing Houghton and Downing, when several other varieties with larger, handsomer, better-flavored fruits, and with plants as hardy and productive, could be grown. Gooseberry-culture in America, therefore, is in the deplorable state of being represented by two inferior sorts, when the culture of a dozen choicely good kinds would sooner or later put the gooseberry in the ranks of the major fruits, as it is in England, where several hundreds of varieties have been introduced, a fair proportion of which are now under cultivation. But nineteen varieties are now prominent enough for mention in America; several of these probably exist in name only, the plants being identical with those of older sorts; and, at present, there is little interest in this fruit. Gooseberry-culture in this country awaits the stimulus of better varieties, the marketing of the ripened product instead of the green, and the increasing demand almost sure to follow these stimulants.

CARRIE. *R. hirtellum* × *R. Grossularia.* In Minnesota, Wisconsin and neighboring states, where only the hardiest fruits can be grown, Carrie is becoming the most popular gooseberry. It is much like Houghton but distinct, although some maintain that it is identical, and does not deserve to replace the older sort where the latter is now established. The variety originated with Wyman Elliott, Minneapolis, Minnesota, from seed of Houghton, supposed to have been crossed with Industry; the seed was planted in 1892.

Plants very large, spreading, dense, productive; canes long, slender, willowy; spines slender, short, few. Leaves large, thick, dull green, glossy, free from mildew. Flowers midseason, singly or in clusters of 2, 3, or 5. Berries small, round-oval, purplish-red, conspicuously veined, grayish bloom; pedicel slender; flesh green, firm, juicy, translucent, pleasantly subacid; quality good to very good; seeds small, rather few.

CHAUTAUQUA. Fig. 270. *R. Grossularia.* It is surprising that Chautauqua is not more generally grown, as it is far superior to Houghton and Downing, which nurserymen keep constantly before their customers. Chautauqua is less easily propagated than the sorts named, hence difficult to obtain and consequently neglected. It is a fine gooseberry of the European type, almost free from mildew, and easily grown wherever the comparatively worthless Houghton and Downing will thrive. The original plant was found by Lewis Roesch, Fredonia, New York, in 1876. It is probably a pure-bred European and possibly an old English sort renamed. Freedom, Columbus, Portage, Triumph, Duplication, Wellington Glory, and Careless are all very similar, and no doubt some of them are identical.

270. Chautauqua. (×1)

Plants medium large, vigorous, stocky, upright-spreading, rather dense, very productive, with but little mildew; suckers few, smooth, straight, rather long, with short internodes, dull, light gray; spines thick, strong, numerous, long, very sharp, in ones, twos and threes. Leaves obovate, taper-pointed, thick; upper surface glossy, light green, smooth, glabrous; lower surface olive-green; margin blunt-crenate; petiole about ¾ inch long, slender, pubescent. Flowers midseason. Fruit midseason; large in diameter, round-oval, silvery green; pedicels ⅝ inch long, pubescent; skin smooth, covered with bloom, thick, tough, translucent; flesh pale green, juicy, firm, sweet; quality good; seeds large, numerous.

COLUMBUS. Fig. 271. *R. Grossularia.* Very similar to Chautauqua, or identical with it, Columbus is offered by several nurserymen as distinct. If it differs from Chautauqua, it is in the fruits, which seem to some authorities to be larger and yellower. On the assumption that it does differ in fruit, it is well to let the variety stand, as it is one of the best of the English gooseberries for American conditions. It was introduced by Ellwanger & Barry, Rochester, New York, some time previous to 1890.

271. Columbus. (×1)

CROWN BOB. Fig. 272. *R. Grossularia.* Mildew, the bane of English gooseberries, keeps Crown Bob from being a valuable variety in America. It is one of the best gooseberries in quality of fruit, its rich vinous flavor making it particularly delectable. To have the fruit at its best, picking must not be hurried. Industry, to which Crown Bob is similar, is much freer from mildew and should be planted in preference to this variety for markets. Crown Bob is an old English sort long grown in America.

272. Crown Bob. (×1)

Plants dwarfish, spreading, vigorous, very productive. Fruit early, dark red, medium to large, nearly round; skin thin, somewhat hairy; flesh firm, juicy, rich, sweet; quality good.

DOWNING. Fig. 273. *R. hirtellum* × *R. Grossularia.* Downing is the standard gooseberry derived from a native species, although it is now agreed by all that it is a hybrid, possibly secondary or tertiary, with the European gooseberry. The vines are wonderfully vigorous, healthy and productive, and the fruits, although small, are smooth, thin-skinned, attractive in appearance, and of very good quality. It is grown more widely in America than any other gooseberry. Houghton is often substituted for Downing, being more easily propagated. The fruit must be picked as soon as full size, since decay sets in soon after maturity. Downing originated from seed of Houghton sown by Charles Downing, Newburgh, New York, about 1860.

273. Downing. (×1)

Plants medium in size, very vigorous, very productive, upright, dense-topped; canes stout, somewhat resembling those of European gooseberries. Leaves large, glabrous; margin crenate, somewhat hairy. Flowers midseason, American type, green tinged with red. Fruit midseason, small, round-oval, pale green with light bloom; skin thin and smooth; flesh soft, juicy, rich, sweetish but sprightly; quality very good; seeds small, numerous.

FREEDOM. *R. Grossularia.* Freedom appears to be identical with Columbus in the plants, and in size, shape, and color of fruit. The two varieties differ, perhaps, in the fruits, those of Freedom having a sweeter, richer flavor and thinner skins. Freedom differs from Chautauqua, if at all, only in slightly larger and somewhat yellower fruits. The origin of the variety is unknown.

HOUGHTON. Fig. 274. *R. hirtellum* × *R. Grossularia.* After Downing, Houghton is the most widely and commonly planted gooseberry in America. However, the variety has several faults and does not deserve its popularity. Faults are: the fruits are very small and uninviting in appearance and taste; the foliage is susceptible to mildew and aphis; and canners, to whom gooseberries are mostly sold, do not like the fruit. Good characters are: the plants are very hardy, vigorous, and productive; the variety thrives under a great diversity of conditions; the berries are rich, sweet, and of excellent quality. This is the oldest American gooseberry of note, having originated with Abel Houghton, Lynn, Massachusetts, in 1833. It is probably a hybrid between a European and an American gooseberry.

274. Houghton. (×1)

Plants medium in size, spreading, very vigorous, very productive; canes rather slender, drooping. Leaves large, dark green, glabrous or nearly so; margin crenate, hairy. Flowers midseason, American type. Fruit midseason, very small, round-oval, dark red with light bloom; skin thin, smooth; flesh firm, juicy, sweet and rich; quality very good; seeds small, numerous.

INDUSTRY. Fig. 275. *R. Grossularia. Whinham's Industry.* By common consent, Industry is given the place of honor as the best of the European gooseberries in America. It is one of the most vigorous varieties of its class; rather more productive than any other European; while by no means free from mildew, it often passes through a season without much mildew, and when infected, the fungus is usually readily controlled by spraying. The large claret-red berries, rich, sweet, and delicately piquant, are about the most inviting of all gooseberries to eye and palate. Picking must not be hurried, if color and taste are to reach the condition where nothing requisite is wanting. Industry has been grown in America for at least a half century, and no doubt would be grown more generally now, were it not difficult to propagate. It is an old English sort.

275. Industry. (×1)

Plants of medium size, vigorous, upright, productive; canes rather straight and stout. Leaves of medium size, thick, dark green, glabrous except on ribs and veins. Flowers midseason, large, borne singly. Fruit early, large, 1¼ inches in diameter, round-oblong, sometimes pear-shaped, smooth or nearly so, deep claret red with

PLATE XV.—INDUSTRY GOOSEBERRY.

lines of light flecks; flesh yellowish-green, firm, juicy, mild subacid, nearly sweet; quality good; seeds medium in size, numerous.

LANCASHIRE LAD. *R. Grossularia.* This variety must be named among the half-dozen best European gooseberries for American culture, being a favorite market sort wherever it succeeds. The fruits stand shipment well and are pleasing in flavor, but unless permitted to mature completely, are somewhat austere. The most important consideration is that the plants are comparatively little infected by mildew. Lancashire Lad is an old English sort long grown in America.

Plants small, erect, compact, a little lacking in vigor, fairly productive. Fruit midseason, medium to large, round or round-oblong, dark red, with lines of light flecks, skin hairy; flesh firm, juicy, mild subacid; quality good; seeds rather small, numerous.

OREGON. *R. hirtellum* × *R. Grossularia. Oregon Champion.* Resembling Downing, of which it is probably a seedling, this variety appears to have merits not possessed by its parent in some regions. Thus, it is strongly recommended in the Pacific Northwest and in Indiana. On the grounds of the Experiment Station, Geneva, New York, it is similar in plant and fruit to Downing, differing in the plants being slightly more productive, while the fruits are yellower at maturity and later in season. The description of Downing answers for this variety, except in the characters named. Oregon is said to thrive under neglect rather better than most other gooseberries. The variety originated with O. D. Dickinson, Salem, Oregon, sometime previous to 1880, when it seems to have been first described.

PALE RED. Fig. 276. *R. hirtellum. American Cluster. Cluster. Ohio Prolific.* Now seldom to be found, Pale Red is worthy of notice only because it is the sole pure-bred representative of *R. hirtellum,* and also one of the oldest American varieties under cultivation. It has many synonyms, of which Cluster and American Cluster are most often used. The vigorous, productive plants and the tender, sweet berries commend the variety. The berries, however, are quite too small for present demands, and if Pale Red has any value, it is as a parent to cross with some large-fruited sort to produce a variety of high quality. When and where Pale Red originated is not known, but it has been grown for at least a century.

276. Pale Red. (×1)

PEARL. *R. hirtellum* × *R. Grossularia.* Although distinct, Pearl is so similar to Downing, one of its parents, that a separate description is not necessary. The two varieties have been tested side by side many times, and all making the comparison agree that Pearl differs from Downing only in the fruits, which have a slightly different flavor and may be larger; possibly the plants are somewhat more productive. Even with the points of superiority, the cultivation of Pearl is not worth pushing, as there are several better varieties. Pearl originated with Wm. Saunders, London, Ontario, from seed of Downing pollinated by Aston's Seedling, a European sort. It was introduced about 1885.

POORMAN. Fig. 277. *R. hirtellum* × *R. Grossularia.* At once attracting attention on account of the vigor and productiveness of the bushes and the handsome appearance and high quality of the fruit, plants and berries of Poorman give it a place as the leader among gooseberries grown in America. The vigor of the variety is so great that the plants must be set farther apart than with most kinds. The berries are larger than those of Downing, best known of American sorts, more oval, and red instead of green; their quality is excellent. The variety originated about 1890, with W. H. Craighead, Brigham City, Utah. It is said to be a cross of Houghton and Downing, and bush and fruit would indicate such parentage. It is also stated that the seed from which this variety grew was brought from Denmark,—a statement hardly creditable from the appearance of the plants.

277. Poorman. (×1)

Plants large, vigorous, upright-spreading, dense, hardy, very productive, not susceptible to mildew; branches stocky, rough, long, usually straight, resembling those of Downing; spines thick, strong, long, less numerous and thicker than those of Houghton, variable in number; foliage healthy. Fruit matures early, period of ripening long, readily picked, ships well; berries over 1 inch long, nearly 1 inch through, oval to slightly obovate, semi-transparent, silvery-green changing at full maturity to pinkish-red; quality good; seeds numerous, small.

PORTAGE. *R. Grossularia.* On the grounds of the Experiment Station, Geneva, New York, it is impossible to tell this variety from Chautauqua; plants have been purchased at different times from several reliable nurserymen. The variety, however, is described as distinct and as valuable by the Division of Pomology, United States Department of Agriculture, in their reports for 1891 and 1894. These authorities describe the fruit as large to very large, yellowish green, with a mild, subacid flavor, and firm flesh, which makes it a good shipper. The variety is little known among berry-growers. It originated with A. H. Hoare, Montana Station, Ohio, as a chance seedling found about 1874.

RED JACKET. Fig. 278. *R. hirtellum* × *R. Grossularia.* Red Jacket has excellent plant-characters, but the berries are quite too small for the variety to have value for commercial plantations. It may have a place in home

plantings or for plant-breeding, as the berries are of especially high quality, being juicy, rich, and fragrant. Red Jacket is a hybrid between Houghton and Red Warrington, a European sort; the cross was made by Wm. Saunders, London, Ontario, about 1876. There is an English variety of the same name, but it is doubtful whether it is to be found in America.

278. Red Jacket. (×1)

Plant vigorous, productive, healthy, being practically free from mildew. Fruit small to medium, round-oblong, reddish-green becoming pale red; skin smooth; flesh firm, juicy, transparent, sweet, rich; quality very good; seeds small, numerous.

RUNGE. *R. Grossularia.* Runge, recently introduced in the Hudson River Valley, appears to be another variant of Chautauqua. It is said that the plants are more productive and less susceptible to mildew, and that the berries are larger and ripen later than those of Chautauqua. At Geneva, New York, the variety cannot be distinguished from Chautauqua, though pains have been taken to obtain it from its original source. The history of the variety cannot be learned; no doubt the original plant appeared as an especially choice bush of Chautauqua in some of the many gooseberry plantations on the banks of the Hudson River.

TRIUMPH. *R. Grossularia.* On the grounds of the Experiment Station, Geneva, New York, it is impossible to tell this variety from Chautauqua, although it is difficult to make sure that the plants came from the original stock. The bush is described by various pomological authorities as being vigorous in growth, comparatively free from mildew, and very productive. The berries are said to be oblong or round-oblong, pale yellow, sweet, rich, and of high quality. Perhaps Triumph is an improvement on Chautauqua, and as such might well be tried. Its origin seems not to be known, but it has been under cultivation since 1885, when it was first mentioned.

VAN FLEET. *R. hirtellum* × *R. Grossularia.* This new gooseberry, a hybrid between an American and a European gooseberry, named after its originator, W. Van Fleet, is being introduced by the J. T. Lovett Co., Little Silver, New Jersey. It is described as follows:

Plant extremely productive, with glossy resistant foliage remaining until early winter. Berries large, roundish, light red; skin thin, smooth; quality very good; seeds few.

WELLINGTON GLORY. *R. Grossularia.* As distributed at present by American nurserymen, Wellington Glory is Chautauqua. If ever distinct in this country, the variety is lost to fruit-growers, if not to nurserymen, many of whom list it. The catalogs describe Wellington Glory as a strong-growing sort, almost free from mildew, bearing large, oblong, smooth fruits, which are pale yellow or nearly white, sweet, and of good quality. Presumably the original plants were introduced from England, and the variety has been in this country at least a half century.

PART VI

HEATH-FRUITS

CHAPTER XXI

BOTANY OF HEATH-FRUITS

The heath family (Ericaceæ) furnishes a domesticated plant without its like for certain soils and without equal for certain purposes. This unique plant is the cranberry. Several other heath plants are favorite wild fruits in all quarters of the globe. These are variously called blueberries, bilberries, huckleberries, whortleberries, whinberries, blaeberries, moorberries, deerberries, farkleberries, cowberries, foxberries, and dangleberries. These plants belong to as many species as there are common names, or more, as some of the common names are applied to more than one species. All, including the cranberry, are members of two genera in the heath family, Vaccinium and Gaylussacia, both of which are composed of woody plants presenting all gradations from slender, delicate, trailing vines to sturdy shrubs. Both genera are of social habit, most of the species, wherever found, covering extensive tracts; both prefer the humus of peat-bogs, swamps, woods, or heath. Vaccinium is much the more important of the two species.

Vaccinium.—Erect or trailing woody plants. Leaves evergreen or deciduous, alternate, leathery or succulent. Flowers axillary or terminal, solitary, clustered or racemed; white or reddish; corolla variously shaped, 4-5 cleft; sepals 4-5 or obsolete; stamen 8 or 10; anthers opening by a hole at the apex. Fruit a berry, 4-5-celled, many seeded, sometimes 8-10-celled by a fake partition from the back of the cell to the placenta; capped by the persistent calyx.

The genus is represented by more than a hundred species, which encircle the globe in the North Temperate Zone, a few being found in the South Temperate Zone. In the northern hemisphere, species are found from the mountains of the tropics to well within the Arctic Circle. Vacciniums are most common in temperate North America and the mountains of central and southern Asia.

There is much confusion in the common names of species of Vaccinium. While the common names found in the botanies, as given on this page may be used or have been used by English-speaking people somewhere or sometime, they are now seldom heard in America. Heath-fruits pass under three common names in North America—cranberries, blueberries, and huckleberries. Red-fruited species of Vaccinium are almost universally called cranberries, with such qualifying adjectives as large, small, low-bush, or high-bush. It is not so easy to define the use of blueberry and huckleberry. In most parts of the United States, the two names are used without distinction, but in the North Atlantic and New England states blueberries are fruits of the genus Vaccinium in which the seeds are numerous but so small as not to be noticed in eating, while huckleberries are fruits of the genus Gaylussacia, the berries of which contain ten large, hard seeds. In some of the central states, huckleberries are the produce of the high-bush, dark-fruited Vacciniums, while the berries of low-growing species are called blueberries. The New England usage of blueberry for species of Vaccinium and huckleberry for the Gaylussacias is best, and the names will be so used in this text.

THE FORM AND STRUCTURE OF HEATH-FRUITS

Cranberries and blueberries are the least known of pomological plants. They belong to a botanical family which has marked peculiarities in structure of plant, in habits of growth, and in choice of environment; moreover, they have been under cultivation so short a time, and their culture is restricted to so few regions, that fruit-growers have not had opportunities to become acquainted with them. It is especially necessary, therefore, that those who grow these fruits should know the gross structure and habits of growth in order properly to propagate, transplant, prune, and otherwise care for them, as well as to identify species and varieties. Fortunately the botany of heath-fruits is easily learned. The structures of fruit and plant, and the habits of growth are distinctive, and, since there are no closely related fruits for which cranberries and huckleberries can possibly be mistaken, all characters of heath-fruits are readily impressed on the mind.

The plant.

As with other fruits, all of the organs and characters of the plant must be portrayed in descriptions of these fruits. Size and vigor of plant usually receive first attention, care being taken not to confuse vigor with size, since small plants may be quite as vigorous—may have just as much internal push—as large plants. The different species and varieties of heath-fruits show quite as many peculiarities of growth as other cultivated fruits, all of which must be characterized. The thickness, color, direction of growth, and length of internodes of the woody parts must all be noted. The stems of some species of Vaccinium are pubescent; of others glabrous. Some are warty, or speckled, or otherwise peculiarly marked. There are low-bush and high-bush forms of both cranberries and blueberries, so

that the height of the plant needs to be set down accurately. Hardiness is of little importance with heath-fruits, but such other constitutional characters as productiveness, adaptability to soils and climates, and susceptibility to pests count for as much in the descriptions of these fruits as with any others. Most of the cranberries are picked with scoops, so that it is necessary to state in a description whether or not a variety is adapted to scoop-picking.

The method of propagating cranberries is by cuttings, which are obtained by mowing vigorous vines in an old bog with a scythe; some varieties are much better adapted to this method of propagation than others, and statements as to suitability for propagation have value in a description. No doubt it will be found that species and varieties of blueberries vary greatly in their adaptability to methods of propagation, which seem to be difficult at best, so that statements in detail as to the best method of propagating species or varieties of blueberries ought to be valuable in any description of this fruit.

The methods of planting and caring for the heath-fruits differ so greatly from those employed with other fruits, that it will require many years to determine which are best. Meanwhile, it may be found that species and varieties differ greatly in their requirements for planting and care, so that, while scarcely permissible with older fruits, some cultural directions can well be given in describing heath-fruits. These, of course, can be given only by those who have expert knowledge, and can hardly be included in a manual of pomology such as this.

The foliage.

The size, shape, position, and angle of attachment of leaf- and flower-buds may be used in identifying heath-fruits, as they are with the fruits longer under cultivation, in which data as to these characters are considered valuable in a full description. Certainly the leaves must be fully described in any description worth taking. The size, color, shape, and texture of the leaves must be faithfully recorded. Leaves of heath-fruits are small and simple in outline, so that drawings can well accompany descriptions.

In separating species of these fruits, size, shape, and color of leaves are fine marks of distinction, and no doubt the pomologist will find them as valuable in separating varieties. In some species the leaves are evergreen; in others, deciduous. The leaves of *V. pennsylvanicum,* one of the blueberries offering possibilities for cultivation, are glabrous southward and pubescent northward. The leaves of the small cranberry, *V. Oxycoccus,* are conspicuously whitened beneath, while those of the large cranberry, *V. macrocarpon,* are but slightly whitened. There is considerable difference in the degree of whiteness of the lower surface of leaves of varieties of cultivated cranberries. The margins of the leaves of the low sweet blueberry, *V. pennsylvanicum,* are serrate, the teeth being bristle-pointed, while the margins of the high or swamp blueberry are entire in the type species, but serrate with bristly teeth in two botanical varieties. Whether the leaves are light-green, dark-green, or blue-green is a fine mark of distinction in separating species of blueberries.

While the characters of leaves as named are those used by botanists, they offer suggestions to those describing the cultivated varieties. So far, few varieties of blueberries have been delimited from the species, but, as will be seen, there are a good many varieties of cranberries of which the fruits are well described, but almost nothing is said of plant, foliage or flower, although these organs must offer valuable means of identification as well as peculiarities that should be taken into account in cultivation.

The flowers.

All of the species of heath-fruits may be identified by their floral organs. Of just how much importance the floral organs may be in the identification of the score or more varieties of cranberries now under cultivation does not appear from the published descriptions or manuscript notes that the author has seen. One may assume, however, from the distinctions between wild types which botanists find, that the floral organs can be made of use in distinguishing domesticated types. Current descriptions of cranberries, if the flowers are mentioned at all, record only the color of the blossoms, which are white more or less marked with pink. The blossoming period is usually mentioned, this being a matter of importance because of danger from frost if the blossoms appear too early. The flowering period is often retarded by flooding until danger of frost is past, so that it is important to state whether the winter water was drawn off early or late. The flowers of cranberries are borne on short upright shoots of the previous season's growth, which are called *uprights.* Full descriptions of varieties should contain a statement of the average number of flowers the upright bears and the number that set fruit.

The fruit.

The heath-fruits so far brought under cultivation, whether species or varieties, are chiefly known by their noteworthy fruit-characters, which at once appeal to the senses of sight and taste. Those describing them characterize groups almost wholly from the fruits, saying little or nothing of the plants. With greater refinements in separating varieties of the several species, more will be said about the plants, although not less about the fruits.

As with other fruits, season of ripening is about the first character and certainly one of the most important characters to be recorded. The period during which the fruit may be kept under the different methods of storage would seem to be desirable, although it is not often stated in current descriptions. A part of the

blueberry crop is canned, a part evaporated, while the largest part is used in the fresh state. Most of the cranberry crop is stored for use in the fresh state. Descriptions of species or varieties of either of these fruits should state the value of the fruit for these purposes. The economic status of varieties of the cranberry is given for the several distinct regions in which this fruit is grown, wide differences of value being found in different states. In giving the economic status, the chief items seem to be the extent of acreage, the yield from an acre, and the current price for a barrel of fruit.

The size and shape of the berries must be given as accurately as possible. The terms *large, small,* and *medium* are hardly accurate enough for the size, and figures for length and diameter should be given, or an outline of a transverse- and horizontal-section. The size of cranberries is often given by stating the number required to fill a half-pint cup. Illustrations may be used to show the shape of the fruits; or, as a rule, the shapes of all heath-fruits are so simple that they may be portrayed very accurately by words Uniformity in size and shape is particularly desirable in cranberries and blueberries, therefore a description must take uniformity into account.

Cranberries are sometimes picked before ripe, or a part of the crop may be unripe; it is therefore necessary to state the color when partly ripe and the color at maturity. It is necessary to know, also, whether the fruit will color well in storage and what the very ripe color is. Thus, at picking time the unripe color may be light pink; when normally ripe, red; and after storage when dead ripe, dark red or almost black. In some varieties there are russeted areas at one place or another on the surface, of greater or less size, which must be noted. Some cranberries are marked by lines which may be impressed or raised in slight ridges. The color of the stem-end may be lighter or darker than that of the calyx-end. The bloom is light on the fruit of some varieties of cranberries, and wanting on the fruits of others.

In spite of the name, not all blueberries are blue. One of the species which furnishes a large part of the wild crop and which may become valuable under domestication, *V. pennsylvanicum,* bears fruit most often bluish-black but which may be black, light blue, or red. One of the huckleberries, *G. baccata,* bears in the type-species blue fruits, but there is a form with blue berries and another with white or pinkish-white, translucent berries. In all of the wild species of blueberries and huckleberries, the amount and character of the bloom vary greatly. From these considerations of wild species, it may be assumed that when Vaccinium and Gaylussacia are domesticated, a wide range in color of fruit may be expected.

The stem offers means of identification in heath-fruits as in other stemmed fruits. Its length, and in cranberries the manner of insertion, whether in a depression or on a neck, are important means of identification. The color of the stem may vary and there may be specific and varietal peculiarities such as wartiness and pubescence. The calyx-end of the fruit is even more characteristic in species and varieties than the stem-end. The apex may be drawn out, flattened or depressed, and the size, shape, and position of the calyx-lobes may be important means of identification.

Perhaps in no fruits do the seeds and the seed-cavity count for more than in the heath-fruits. In cranberries the number of seeds in named varieties varies in individuals from seedlessness to fifty seeds, with the average varying from six to twenty-four. In huckleberries there are commmonly ten seed-like nutlets, which are sufficiently large to be unpleasant. In blueberries the seeds are small but numerous, the number and size of the seed materially affecting the palatability of the fruit. The size and shape of the seed-cavities in the different species and varieties, as determined by sectioning, are variable, and hence of use in distinguishing the value of the fruit as a food product. The thickness of the flesh between seed-cavity and surface might also be stated, in which connection the texture of the flesh ought to be designated, whether tender, tough, melting, or crackling.

Heath-fruits are usually picked with scoops; in some cases are raked off the plants; or other mechanical devices for harvesting may be used. In these rapid methods of picking, much foreign matter is gathered with the fruit, making it necessary to run the crop through cleaning machines. The effectiveness of some of these separators depends upon the resiliency of the berries, sound fruits bouncing like little rubber balls, while the unsound fruits have lost their elasticity. It follows that a statement of the resiliency of the fruit, with the cranberry in mind in this particular, must be made in describing a variety; or, at least, the cleaning quality of the fruit should have notice.

This brief discussion of the structure and form of heath-fruits prepares the way for a consideration of the species of cranberries, blueberries, and huckleberries now under cultivation or in process of domestication. Besides these, it should be said, there are a considerable number more that are proper subjects for domestication, toward the amelioration of which practically nothing has been done. The cranberry, as the first of these fruits to be brought under the hand of man, and as by far the most important in commerce, merits attention first.

CHAPTER XXII

THE CRANBERRY AND ITS VARIETIES

Cultivated cranberries belong to two species of Vaccinium. Both species are slender, trailing, evergreen bog-plants, bearing variously shaped light or dark-red berries in great profusion. The name comes from the fancied resemblance of the bud just before opening, with its slender curving pedicel, to the head and neck of a crane, whence craneberry, now shortened to cranberry. The small cranberry, *V. Oxycoccus*, is little cultivated, while the large cranberry, *V. macrocarpon*, is grown on thousands of acres in the United States and Canada, its culture furnishing one of the most specialized and interesting of all pomological crops.

1. *Vaccinium macrocarpon*, Ait. Large Cranberry. American Cranberry. Stems slender and creeping, but comparatively stout, 1-4 feet long, the flowering branches ascending. Leaves oblong-elliptic, ⅛-½ inch in length, 1/6-⅓ inch broad, blunt or rounded at the tip, flat or inclined to be revolute at the margin, evergreen, leathery, dark green and glossy above, whitened beneath, glabrous. Flowers pale rose-colored, nodding, 1-10, borne on long filiform pedicels, borne in early summer; corolla 4-parted; filaments scarcely ⅓ the length of the anther. Fruit maturing in the autumn; ⅓-1 inch in diameter; oblong, round, ovate or obovoid in shape; light red to dark red; and more or less astringent.

The large cranberry is an inhabitant of open bogs, swamps, and damp heaths from Newfoundland to Wisconsin and southward to West Virginia and Arkansas, being most commonly found in the northeastern quarter of its range. In cultivation, its range is extended to the Pacific Coast, where Oregon and Washington have a considerable number of cultivated bogs.

The early settlers in the New England and North Atlantic states were not slow in discovering that cranberries made an excellent sauce to accompany the fare of game upon which they chiefly subsisted, but cranberry-culture did not begin until the nineteenth century was well started, 1810 being the date given for the establishment of the first artificial bog. The abundance of the wild crop obviated the necessity of domesticating the cranberry. Also, as there were no bog-plants under cultivation for fruit, methods of treatment had to be invented: the fruit-growing lore of centuries and even the tools for cultivation were useless in beginning the cultivation of the cranberry. The Cape Cod peninsula was the home of the pioneers in cranberry-culture, and still holds first rank among the several cranberry districts of the continent. At first there were no named varieties of this fruit, but cranberries vary greatly in size, color, and shape, so that types soon came into existence, the earliest being the Bell, the Bugle, and the Cherry. Later, or to be specific, about 1890, named varieties began to appear, since which time a score or more, most of which are still under cultivation, have been introduced.

The cranberry industry is now well established in several centers in North America, chief of which are, in order of importance, the Cape Cod region of Massachusetts, New Jersey, Wisconsin, Nova Scotia, western Oregon, and western Washington. The requirements for cranberry-culture seem to be: (1) Level land in a sandy region; (2) water to flood the bog; (3) drainage so that the water-table is a foot below the surface in the growing season; (4) comparative freedom from frosts. The ideal soil is one of peat several inches in depth, under which is sand, in its turn superimposed on a clay hardpan, which must be almost or quite impervious to water. The surface of the bog, in some regions, is mulched with three to five inches of sand. Neither soil nor water for flooding must be alkaline, and the soil must be acid. Bogs are usually located in situations where cranberries or other heath-plants thrive in the wild. The subjugation of wild bog-lands, the building of dams, canals, leveling the land, and sanding, make a cranberry-bog an expensive plantation to lay out and maintain.

Since its inception a century ago, the cranberry industry has steadily grown, the annual yield at the present time for the United States being estimated at 40,000,000 quarts. The crop is largely handled by coöperative associations of growers organized for improveing methods of cultivation, obtaining new varieties, and distributing the product to consumers. The several cranberry associations, in their turn, are organized into the American Cranberry Exchange, which markets the whole output of the associations. This statement of the method of handling the crop is necessary to lead up to an account of a peculiarity in the method of classifying cranberries.

The American Cranberry Exchange in 1919 handled varieties of cranberries, which were sold under eighty brands, the brands being established in accordance with variety, color, and size. Thus, Early Black, a leading variety, is sold under six brands in New England and

three brands in New Jersey. Varietal names are as lasting and stable as those of other fruits, but the names of brands may change from season to season.

2. *Vaccinium Oxycoccus,* Linn. Small Cranberry. Cranberry of the Old World. Stems very slender, almost hair-like, erect or ascending, more slender and shorter than those of *V. macrocarpon.* Leaves oblong or ovate, acute, ¼ inch long, strongly revolute margins, leathery, evergreen, dark green and glossy above, conspicuously whitened beneath; pedicels 1-4, terminal, the pale rose-colored flowers nodding; corolla 4-parted; filaments ½ as long as the anthers. Fruit maturing in late autumn; smaller than in the last, ¼-⅓ inch in diameter; roundish and less variable than in the last; red and acid but considered superior in flavor to the large cranberry of more common cultivation.

The small cranberry is an inhabitant of temperate, subarctic, and alpine regions of North America, Europe, and Asia, and is usually found in sphagnum swamps The species is sparingly cultivated in the Old World, and the wild fruits are highly prized by northern peoples in both the Old and New World. No one seems to have given attention to the hybridization of the large and the small cranberry, although the two would no doubt hybridize, possibly giving a better flavored fruit in the offspring than in either of the parents.

3. *Vaccinium Vitis-Idæa,* Linn. Mountain Cranberry. Cowberry. Foxberry. Low-bush Cranberry. This cranberry is much used in Europe and in some parts of Canada, especially Nova Scotia, where it is harvested and shipped to the markets of New England. It is not cultivated although there appear to be no reasons why it could not be cultivated. The plants are shorter, dwarfer and less productive than those of the other two species. The fruits are smaller, scarcely larger than currants, darker red, more acid and more astringent, but edible and very good for culinary purposes.

The mountain cranberry is an inhabitant of colder regions than the other two species, and prefers dry and rocky banks to wet lands. This species is suitable for dry-land cultivation, the practice of which would obviate the necessity of making bogs, building dams, draining, and flooding.

VARIETIES OF CRANBERRIES [1]

BATCHELDER. *Holliston. Mammoth.* These three names are used for the same variety in different localities. The fruits are described as oblong in shape, extra large, fine in flavor, and as very desirable for the October trade of eastern and central markets. The variety seems to be grown only in Massachusetts, and its origin is not given.

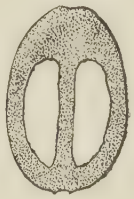
BELL AND BUGLE. This so-called variety is a mixture of two types, as the name implies, which has been under cultivation in Wisconsin for the past thirty years. The Bell type in this mixture is much the same as in the better-known Bell and Cherry variety to be described next. The bell-like berry is a longer fruit than that in the Bell and Cherry group; the bugle-like berry is still further prolonged with much less bulge than that in the bell type. The Bell and Bugle berries are a little larger than those of the Bell and Cherry. The berries are of a uniform bright red color, ready for shipment about October 10, and keep and ship well. The variety is listed by the American Cranberry Exchange under the Monogram and Pennant brands. Bell and Bugle is becoming unpopular in Wisconsin owing to its susceptibility to "false blossom," a condition in which fruits apparently set but fail to develop.

BELL AND CHERRY. *Natives (of Wisconsin).* The standard cranberry in Wisconsin is a mixture of the bell and cherry types, giving the trade name of Bell and Cherry, though growers usually call the mixture "Natives." In acreage, this is the principal variety, if the mixture can be called a variety, grown in Wisconsin. It is the original cranberry found on the marshes of central Wisconsin, and has been the commonest group under cultivation for the last thirty years. The American Cranberry Exchange separates the two types in marketing the fruit, selling the round shapes of uniform size under the Badger and Poppy brands, and the bell-shaped berries of larger size under the well-known Bouquet brand.

Vines vigorous, productive, without the dense matting of McFarlin, which is a standard named variety of this type. Leaves averaging smaller than those of McFarlin. Fruit of the bell type, tapering at the stem-end and larger at the blossom-end which is flat; fruit of the cherry type round with both stem- and blossom-ends flattened with slight indentations; color of both types uniformly red without distinct markings; size ⅞-½ inch in diameter; usually ready for shipment soon after October 5.

BELLE OF THE CAPE. The American Cranberry Exchange lists Belle of the Cape as a distinct variety, but some authorities believe it to be identical with Centreville, to which, at any rate, it is very similar. Its origin is not given.

BENNETT JUMBO. Fig. 279. This variety is characterized by late, long-keeping cranberries, of the Jumbo type, which are olive-shaped and of large size. The plants are very vigorous, productive, and blossom late, thereby escaping late spring frosts; the blossoming season is from June 20 to July 15th. Bennett Jumbo is considered one of the best late varieties in Wisconsin. This variety came from a small patch of cranberries found by A. C. Bennett, Grand Rapids, Wisconsin, about 1890.



279. Bennett Jumbo. (×1)

Vines very vigorous and productive, more so than those of the Bell and Cherry. Leaves larger and of the same dark olive-green color as those of Bell and Cherry. Flowers late. Fruit large, ⅞ of an inch in diameter, ¾-1 inch long, olive-shaped; red-ribbed on green or

[1] The descriptions of varieties of cranberries have been compiled from notes furnished by H. G. Franklin, Massachusetts Agricultural Experiment Station, and O. G. Malde, Wisconsin Agricultural Experiment Station.

light gray, approaching white at maturity, but when very ripe bright red with ribs of darker red; ready for shipment after October 20.

BERRY BERRY. Berry Berry is listed by the American Cranberry Exchange under the Whitehouse Brand as a Cape Cod fancy cranberry. The fruits are described as round or oblate in shape; of large size; dark red in color; and as ready for shipment after October 1. The crop is said to be very suitable for eastern markets. The quantity produced is limited. The origin of the variety does not appear.

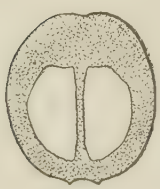
BLACK VEIL. This variety is distinguished by its early fruits, the crop usually ripening not later than the first of September. It is of the type of the well-known Early Black. While still on probation, Black Veil seems very promising in the Cape Cod region. The first growers were Frank Stanley and Joseph McFarlin, South Carver, Massachusetts, who introduced the variety about 1890.

Plants much like those of Early Black; foliage light green; average crop to the acre, 55 bbls.; susceptible to the cranberry fruit-worm. Fruit very early; when full seeded round, oblong when few seeded; pinkish white when partly ripe, red at maturity and almost black when very ripe; flesh firm; quality for keeping, shipping and table, fair; seed 8-13.

BRADDOCK BELL. Braddock Bell is listed under the Ruby Brand by the American Cranberry Exchange as a fancy cranberry grown in limited quantities in New Jersey. The fruits are described as bell-shaped, large, dark red, glossy, and as keeping well. It is spoken of as a good sort for distant shipments. The crop is ready for market after October 25.

BUGLE. *Black Diamond.* This is one of the old varieties which was largely planted on Cape Cod some years ago, but is not being planted now because of unproductiveness and sensitiveness to frost. It seems never to have been grown extensively elsewhere. The variety first came to notice with Joseph Wing, East Sandwich, Massachusetts, about 1875.

Vines rather coarse with many runners and only fairly well suited for scoop-picking; about half as productive as Early Black, average crop being 27 bbls. to the acre. Fruits late, usually not ripe before October 1 on Cape Cod; berries rather small, 90-120 to the half-pint; somewhat elongated with the ends strongly conical; red, becoming dark red when very ripe; flesh very firm; not easily cleaned, excellent for keeping and shipping, fair in table quality; seeds rather numerous, 12-23.



280. Centennial. (×1)

CENTENNIAL. Fig. 280. All agree that the fruits of this variety are unsurpassed in appearance and in table qualities. Centennial is not grown largely in Massachusetts; is hardly known in Wisconsin; but is highly prized and much grown in New Jersey. The variety originated with George Batchelder, Hollister, Massachusetts, about 1876.

Vines coarse, with many runners and poorly suited for scoop-picking; foliage rather dark green; about as productive as Early Black, averaging 55 bbls. to the acre. Fruit late, ripening about October 5, on Cape Cod; large, 59-90 berries to the half-pint, uniform round; uniformly red, becoming dark red when very ripe; with four rather prominent ridges forming a rough cross; flesh rather thin but extra fine in table quality; seeds 14-26.

CENTREVILLE. *Belle of the Cape. Lewis.* This variety is described by all as producing fruit that is particularly handsome, of extra fine flavor, and as very desirable for the fancy trade of eastern and central markets. Notwithstanding its fine fruit, Centreville is grown only in a limited way in Massachusetts and New Jersey, and scarcely at all in Wisconsin. Chipman and Matthews are very similar in vine and fruit but hardy as desirable, all things considered. The variety originated with T. Fuller, Centreville, Massachusetts, about 1882.

Vines coarse with many runners; yielding about 55 bbls. to the acre; poorly suited for scoop-picking. Leaves dark green in the summer; very similar to those of Howes. Fruit late, ripening in Massachusetts about October 5; berries very large, 60-90 to the half-pint cup; elongated with both ends conical; uniform in size and shape; medium red, becoming dark red; fruits coloring poorly in storage; not easy to clean, and do not keep or ship well; table quality superior; seeds 9-13.

CHAMPION. A small acreage of Champion is grown in New Jersey, the crop being sold as extra fancy by the American Cranberry Exchange under the Globe brand. The berries are described as very large, oblong, bright red. The crop is ready for shipment after October 20, and is listed as very desirable for the fancy trade in eastern and central markets.

CHIPMAN. Fig. 281. The fruits of Chipman are described in the publication of the American Cranberry Exchange as of bugle shape, and as so similar to those of Centreville that they are sold under the same brand as the crops come from New Jersey bogs. In Massachusetts, the crop is sold under another brand, but the fruits of the two varieties, as in New Jersey, are very similar. The berries are described as of extra fine flavor, and as ready for shipment after October 20. The quantity grown in both states is small,

281. Chipman. (×⅔)

and the variety is comparatively unimportant. The origin of Chipman seems not to be known.

EARLY BLACK. Fig. 282. The oldest of the named varieties, Early Black is still the standard early cranberry in Massachusetts and New Jersey, being little grown elsewhere. A greater acreage of this variety is grown in Massachusetts than of any other. Early in the season, the crop is sold as Early Black; but the berries keep so well that cranberry dealers find it profitable to call it Late Red during the last of the season. The fruit is very suitable for long distance shipment. The variety is rather susceptible to the fruit-worm. It seems to have originated about 1835 with Capt. Cyrus Cahoon, a Cape Cod cranberry-grower.

282. Early Black. (×1)

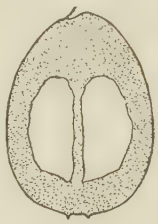
Vines comparatively slender, producing uprights rather than runners; productive, averaging 55 bbls. to the acre. Leaves comparatively small, light green in the summer, reddish in the winter. Flowers white, but little marked with pink. Fruit very early, Black Veil alone ripening earlier; berries small, 80-150 to the half-pint; when full seeded the berries are round with the stem-end slightly conical, but oblong when seeds are few; pinkish white, then red and when very ripe almost black; colors well in storage when picked green; flesh firm, good for keeping, shipping and the table; easily cleaned; seeds 7-17.

EARLY OHIO. This variety is of the bell type, and is very similar in plant and fruit to the better-known Prolific. The original plant was found in a wild bog by C. D. Leach, Walton, Michigan, some thirty or more years ago. The fruits are esteemed for earliness and for their mild, pleasant flavor, being palatable in the raw state, which is true of very few other cranberries. The variety is grown only in Wisconsin and Michigan.

EARLY RED. This variety is listed in the booklet of the American Cranberry Exchange as a sort with fruits "round in shape; good size; ready for shipment after September 20". The quantity is said to be limited, and the crop to be desirable for the eastern and central markets when classified under two grades, according to color. The variety is grown in both Massachusetts and New Jersey. The origin of the variety is not known.

HOWARD BELL. Under the Olive brand, the crop of this variety is sold by the American Cranberry Exchange as a fancy product in eastern markets. Howard Bell is grown in New Jersey, the acreage being small. The crop is ready for the market after October 25, and is very desirable for long distance shipments. The berries are described as large, bell-shaped, and excellent in flavor.

HOWES. Fig. 283. *Late Howe.* Howes is the standard late cranberry in Massachusetts and New Jersey, attaining popularity chiefly because of the excellent keeping quality of the fruit. Unfortunately, the variety is not always productive. The fruit is especially prized for long distance shipments. Pointed Howe seems to be a strain of Howes grown in New Jersey. The variety originated with James P. Howes, East Dennis, Massachusetts, some time prior to 1880.

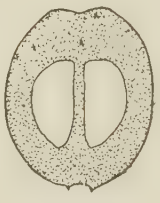


283. Howes. (×1)

Vines rather coarse, with many uprights and comparatively few runners; not as productive as Early Black, averaging 40 bbls. to the acre in Massachusetts; rather susceptible to the rose-bloom and to the blackhead fire-worm. Leaves large, dark green in the summer, very dark red in the winter. Flowers white, much marked with pink. Fruit late, ripening in Massachusetts about October 5; berries a little under medium size, 80-140 to the half-pint cup; round when well seeded, oblong when poorly seeded, symmetrical; red and indistinctly striped, becoming dark red; colors exceptionally well in storage; flesh very firm, excellent for keeping and shipping, fair for the table; easily cleaned; seeds 7-15 as an average.

JERSEY. Under this name the wild cranberry of New Jersey is offered by the American Cranberry Exchange. It is said that more of these "natives" are grown in the cultivated bogs of the state than of any distinct named variety. The berries are variable in size, shape, and color. They are usually ready for market after October 15. The fruit is of long-keeping and good-shipping qualities and very desirable for distant shipment. A large percentage of the crop of this variety is shipped uncleaned, the product keeping better when packed and stored in this manner.

McFARLIN. Fig. 284. McFarlin is one of the few cranberries grown in both the East and the West. It is rather more highly prized in Wisconsin and in the Pacific states than on the Atlantic seaboard, although at one time it was one of the three leading varieties in the eastern states. The variety originated with T. H. McFarlin, South Carver, Massachusetts, about 1874.



284. McFarlin. (×1)

Vines coarse with many runners, poorly suited for scoop-picking; about as productive as Early Black, bearing 55 bbls. to the acre. Leaves medium green, rather large. Flowers distinctly marked with pink. Fruit midseason, usually ripening about September 20; berries large, 65-95 in half-pint cup; round-oblong, flower-end conical; lacking in uniformity, size and shape; red becoming dark red when very ripe; flesh tender, extra fine in flavor; variable in keeping and shipping quality; seeds 9-23.

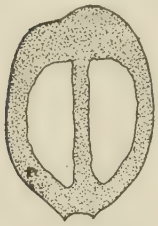
MATTHEWS. This variety is so similar to the better-known and more desirable Centreville that it needs no separate description. The fruit is usually sold under the same brand in New Jersey as Centreville, the Swan brand

from this state including these two and Chipman. The crop ripens a little earlier than that of Centreville; the berries do not average quite so large; the seeds are a little more numerous; and the variety is a little more susceptible to the disease known as "rose-bloom." Matthews originated with Isaiah Matthews, Yarmouth, Massachusetts, about 1880.

METALLIC BELL. This variety, grown only in Wisconsin, is listed by the American Cranberry Exchange as an extra fancy sort under the Beaver brand. The berries are described as bell-shaped, lightly colored, extra large, and as ready for shipment after October 10. The quantity grown is limited, and the variety is falling into disfavor owing to "false bottom", a condition in which fruits apparently set but fail to develop.

NATIVES (of New Jersey). Under this varietal name and under the Pioneer Brand, the American Cranberry Exchange offers fruit described as follows: "Irregular shape and size; medium to dark red color; ready for shipment after October 20th, and suitable for long distance shipment. Quantity very limited."

PLUM. Fig. 285. The product of this variety is sold by the American Cranberry Exchange under the Plum brand as extra fancy. This cranberry is grown only in New Jersey, and is named Plum because of the size and shape of the berries. There has never been a large acreage of Plum planted, nor is it increasing. The crop is ready for market about October 15, and is especially desirable for the extra fancy trade in eastern markets. The berries are extra large, handsomely colored, and excellent in flavor.



285. Plum. (×1)

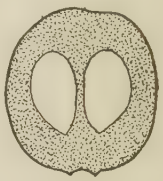
PRIDE. Fig. 286. *Belle of Carver. Vose's Belle.* Pride is a new sort strongly recommended because of the great productiveness

286. Pride (×1)

of the vines, which are said to be half again as productive as those of Early Black, a variety long regarded as the standard in productiveness. At present, Pride is grown only on a few bogs in Massachusetts. It originated with Benjamin F. Vose, Rochester, Massachusetts, about 1890.

Vines coarse with many runners, enlarged at the juncture of branches, the fruiting uprights producing one or more branchlets the season they fruit; very productive, about 80 bbls. to the acre; poorly adapted to scoop-picking; susceptible to the cranberry fruitworm. Leaves light green. Fruit midseason, ripening about September 15 in Massachusetts; berries of medium size, varying greatly; bell-shaped, the calyx-end being rounded and the stem-end conical, variable; white with pink blush when partly ripe, becoming solid red and then dark red when very ripe; flesh fairly firm, keeping and shipping well and of a good flavor; not easily cleaned; seeds 7-15.

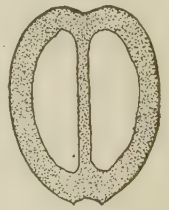
PROLIFIC. Fig. 287. This variety is finding favor in the great cranberry region of central Wisconsin, and in the few Michigan districts where cranberries are grown. The berry is large, cherry-shaped, ripens early, and is of excellent flavor. Because of handsome appearance, early season and good flavor of berries, the American Cranberry Exchange offers the crop under the Chief and Bessie brands as a fancy and an extra fancy fruit. The quantity grown is small. The variety originated with C. D. Leach, Walton, Michigan, in the late eighties of the last century.



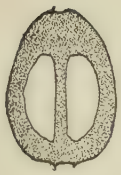
287. Prolific. (×1)

Vines vigorous, approximately the same as those of Bennett Jumbo, fairly productive. Flowering season early, usually from June 10—July 4. Fruit ⅝-¾ inches in diameter, sometimes larger, cherry-shaped; color a uniform red becoming dark red; finely flavored and less tart than later varieties; one of the earliest berries grown in Wisconsin, being ready for shipment about October 1.

SEARLES JUMBO. Fig. 288. This is a cranberry of the Jumbo type similar to the better-known Bennett Jumbo. The fruit is about the same size as that of the latter, possibly averaging a very little larger, is of the same shape, but in color is more uniformly red, not quite so dark red as that of the standard Bell and Cherry at the same stage of ripeness. The vine is more vigorous and slightly more productive than that of Bennett Jumbo. It is a medium season variety, the crop ripening just a little later than that of the Bell and Cherry of Wisconsin and the Early Black of Cape Cod. The crop is ready for shipment about October 15. Searles Jumbo was propagated by A. Searles, Grand Rapids, Wisconsin, from a few vines found growing among Bell and Cherry plants in central Wisconsin toward the close of last century.



288. Searles Jumbo. (×1)



289. Smalley. (×1)

SMALLEY. Fig. 289. This variety seems to be described only by the American Cranberry Exchange. The fruits are round or bell-shaped; ready for shipment about October 15. The quantity grown is said to be small, and is sold under the Chipmunk brand, in which the berries are of medium red color and medium to large size; and the Pocahontas brand, the berries of which are well colored and of average size.

WALES HENRY. Fig. 290. This variety is described as a most promising cranberry, now grown on only a few bogs in Massachusetts. Productiveness of vines, and berries that may be easily cleaned, keep and ship exceptionally well, and of excellent flavor, are the qualities that recommend Wales Henry. The variety originated with W. A. Andrews, North Carver, Massachusetts, about 1885.

Vines rather coarse, with many uprights and few runners; very productive, bearing 60 bbls. to the acre; well adapted to scoop-picking. Leaves dark green.

290. Wales Henry (×1)

Fruit midseason, usually ripe about September 20, medium in size, round; uniform in size and shape; indistinctly striped with varying shades of red, coloring well in storage; flesh firm, keeping and shipping well; excellent in flavor; easily cleaned; seeds 12-18.

CHAPTER XXIII

BLUEBERRIES AND HUCKLEBERRIES

Several species of blueberries and huckleberries are now under process of domestication, though all attempts in the past to bring these fruits under cultivation have failed. Failure seems to have been due to the fact that two peculiarities in the nutrition of these plants were not recognized. Heath-plants will not grow in soils with an alkaline or neutral reaction; nor without the companionship of a beneficial root-fungus. It has been known for many years that these plants will grow only in acid soils, but only recently was the discovery made that there is an association between them and a root-fungus which is indispensable to their well-being. With an acid soil and proper conditions for the root-fungus, it is demonstrated that these fruits can be cultivated profitably. There is now little question that sometime there will be numerous varieties of cultivated blueberries and huckleberries to enrich pine plains, mountain lands, swamps, heaths, and gardens that have proper soil conditions. Cultivated blueberries and huckleberries would add much to fruit-growing, for these are among the best of small-fruits, and by far the most valuable wild fruits of this continent, the crop selling for several million dollars annually.

BLUEBERRIES

What blueberries offer possibilities for cultivation? Eight species of Vacciniums, the true blueberries, are worthy of consideration. All are distributed rather widely in the United States and Canada; all yield fruits valuable as esculents; and all give promise for domestication.

1. *Vaccinium corymbosum,* Linn. Fig. 291. High Blueberry. Swamp Blueberry. Plants tall, 4-12 feet high, with yellowish green, warty branchlets. Leaves 1½-3 inches long, ovate to elliptic-lanceolate, smooth or slightly hairy beneath, the margins entire, half-grown at flowering time. Corolla white or pinkish, ¼-½ inch long, ovoid to cylindric-urn shaped. Fruit blue-black with bloom ⅓-½ inch in diameter; flavor sweet, rich, excellent.

This species inhabits bogs and moist woods, and is sometimes found on heaths and in pastures from Maine to Minnesota and southward. This is an exceedingly variable form, which authorities variously divide into species and natural varieties, or, on the other hand, combine with one or two other species. It is probable that there are many natural hybrids between this and other species.

The high blueberry is the species most desirable for cultivation, so far as attempts to domesticate have yet gone. It is commonly thought that the high blueberry grows best in swampy situations, but it is often found on dry lands and in bogs and swamps, and the land must be dry in the root-forming period of summer and autumn. In culture, this species does not thrive in land permanently water-logged; on the other hand, it requires moderate soil-moisture throughout the season.

The fruit of the high blueberry ripens from August to late September, and is most variable

291. High Blueberry (×½)

in shape, size, color, and flavor. The plants range from handsome shrubs ten to twelve feet high in boggy places to low bushes four or five feet high in heaths and pastures. This variability in fruit and plant indicates that the high blueberry is one of the most plastic of organisms, and bodes well for its improvement under cultivation. The writer knows of a locality in which plants with large black berries, pleasantly piquant, may be found; near at hand are bushes with blue berries, rich and sweet, at least a half-inch in diameter; while another form has blue fruits with very heavy bloom and a delicate flavor so sweet as to be almost honeyed. These and other forms might easily by hybridized within the species, or with forms of other species, to the great improvement of blueberries. The fruits of the high blueberry are borne on the extremities of branches of the past season's growth. This species is a handsome ornamental.

2. *Vaccinium atrococcum,* Heller. Black High Blueberry. Downy Swamp Blueberry. This species is so similar to the last that for the pomologist it scarcely

needs a description. It differs chiefly in the leaf, which is downy beneath; in the flowers, which appear before the leaves expand, those of the last species appearing when the leaves are half grown, and which have a shorter, greener corolla with more red; and in the fruits, which are glossy black without bloom, smaller than the last and of even better flavor. It has the same pomological possibilities as the preceding, with which it hybridizes freely.

3. *Vaccinium virgatum,* Ait. High Blueberry. Swamp Blueberry. This is the high or swamp blueberry of the South, differing from *V. corymbosum* in but a few trivial characters. Thus the flowers of this species are pinker than those of the northern form; are often borne on virgate or naked branches instead of leafy ones; and appear before or with the leaves instead of when they are half grown. The berries are usually blacker, nearly or quite destitute of bloom, and not so well flavored.

The species is found in swamp and pine-barrens from New Jersey to Florida. In the type species, the plants are from two to twelve feet high, but there is a botanical variety in the southwestern range of the species which is much lower, the plants mostly less than two

292. Low Blueberry. (×½)

feet in height. In this southwestern variety, the leaves are smaller, and the flowers are whiter and borne in shorter and closer clusters than those of the type. Presumably this species has the same potentialities for domestication as the northern high blueberry.

4. *Vaccinium pennsylvanicum,* Lam. Fig. 292. Low Blueberry. Sweet Blueberry. Early Blueberry. Plant dwarf, ½-2 feet in height; stems and branchlets green and warty, glabrous or pubescent northward. Leaves oblong or lanceolate, serrulate with bristle-pointed teeth, bright green, smooth and glossy on both sides, sometimes hairy on the midrib beneath. Flowers borne on short pedicels; corolla cylindric-bell-shaped, short, greenish-white. Fruit large, bluish-black, black, sometimes red, or rarely dull white, with or without bloom; sweet and pleasant in flavor; earliest to ripen.

The low blueberry is found covering great areas in dry heaths, pine barrens, and mountain lands from Newfoundland to Saskatchewan, and southward to Virginia and Illinois. The species is most variable, but only two natural varieties are described: var. *angustifolium,* Gray, is a dwarf northern or high-mountain form with narrower leaves; and var. *nigrum,* Wood, called the low black blueberry, has firmer leaves, blue-green, glaucous, with very black, bloomless berries. This variety is often associated with the species, or may be found by itself.

This dwarf species furnishes most of the blueberries found in the markets, but seems not to yield to cultivation so readily as the high blueberry. It is more of a wilding, preferring rocky heaths, pine woods, shady places, and mountains, where often it thrives in soil an inch or two in depth. The berries, which ripen in July in central New York, a month earlier than those of the high blueberry, are the most pleasantly flavored of all the blueberries, having a delicate sugary taste. They are, however, soft and easily bruised, and must be handled with care for distant shipment, but are well suited for canning and drying. Most of the crop canned in New England and Michigan is of this species; the industry of canning them is now an extensive one. The berries hang on the bushes until all are ripe, so that pickers can harvest them with great rapidity. The aborigines set the example to early settlers of sun-drying and smoke-drying this blueberry for winter use, and the practice of drying in the sun still survives. This species may sometime be domesticated, in its many forms, for the very poorest soils or for shady places.

5. *Vaccinium canadense,* Kalm. Canadian Blueberry. Sour-top. Velvet-leaf. Plant a low shrub, 1-2 feet high, erect, much branched, with very pubescent branchlets. Leaves oblong-lanceolate, entire, dark green, ¾-1½ inches long, downy on both sides. Flowers greenish white, sometimes tinged with red. Fruit blue, rarely black, with heavy bloom, small or medium in size, late, rather acid.

The Canadian blueberry is found on dry plains, swamps, and woods from Labrador to Manitoba, southward to Illinois, and in the mountains to Virginia. A form with white fruit is rarely found. This species is closely allied to the low blueberry, but bears smaller, later, and more acid fruits, and has broader and more downy leaves.

Great productiveness and lateness in ripening are the characters that commend this species most highly. In its southern range, the Canadian blueberry ripens from one to three weeks earlier than the low blueberry, but the difference grows less northward, until at its northern limits the two species mature at nearly the same time. The piquancy in flavor is liked by some, but generally the sweeter flavored berries are preferred.

6. *Vaccinium vacillans,* Kalm. Late Low Blueberry. Plant low, ½-3 feet high, erect, glabrous, widely branched, the branchlets being yellowish-green. Leaves obovate or oval, 1-2 inches long, broad, entire or minutely serrulate, very pale or dull glaucous above and beneath. Flowers in dense clusters at the extremities of last year's growth; calyx usually reddish; corolla short, greenish-white or yellow, often tinged with red. Fruit large, blue, rarely white, with heavy bloom, late, sweet, borne abundantly.

The late low blueberry is usually found in sandy or rocky places in northeastern United States from Maine to Michigan and Wisconsin. It is one of the commonest dry-land blueberries, being especially plentiful in the north central states.

There seems to have been no attempt to cultivate this species, although its large, sweet berries, borne in great abundance, mark it as promising. The wild plants are easily told by the fruiting habit. The berries are borne at the ends of last year's wood, which is two to four inches long and leafless, giving the plant a bare aspect. The fruit, so borne, can be stripped off by the handful, with no leaves and comparatively few fruits to bother. The fruit ripens in northern Michigan in August. The plant is quickly renewed when blueberry plains are burned over.

HUCKLEBERRIES

The huckleberry belongs to the genus Gaylussacia, plants closely allied to Vaccinium, in which genus they were at one time included, and having much the same aspect. Generic differences for separating the two are found in the structure of the fruit and in the leaves. Species of Vaccinium are four- or five-celled, with many small seeds, while those of Gaylussacia are ten-celled and contain ten rather large hard-walled seeds which are really nutlets. The leaves of Gaylussacia are liberally besprinkled with resinous dots; those of Vaccinium have no dots. Five species are found in North America, of which four yield fruits much esteemed as they come from wild plants, which give promise of valuable domesticated fruits.

The huckleberry is not so popular as the blueberry because of the hard seeds, which are objectionable in eating. There is, however, great variation in the size and hardness of the seeds, and under cultivation forms could be selected with fewer, smaller, and softer seeds. Except for the seeds, huckleberries are as pleasantly flavored and as palatable as blueberries; and in spite of the seeds find ready sale in the markets. There are no data upon which to form an opinion as to whether huckleberries will yield readily to cultivation. Presumably, the difficulties of domestication will be no greater than with the blueberry. In the wild, huckleberries respond markedly to environment; the fruits of the several species show great differences in size, color, and flavor in accordance with soil, moisture, light, and individual plants, indicating that the opportunities will be great for improvement by cultivation and selection. Like the blueberries, huckleberries grow best in bog or heath and are impatient of lime.

1. *Gaylussacia baccata,* Koch. Black Huckleberry. Dwarf shrubs, 2-3 feet in height, erect and rigid, much branched, slightly pubescent and resinous when young. Leaves oval, oblong-ovate or oblong, clammy with resinous globules when young, yellowish green above, paler beneath, 1-1½ inches long. Flowers in short, one-sided racemes, borne on short pedicels, nodding, reddish, with reddish bracts. Fruit black, a white form not uncommon, without bloom, sweet and pleasant.

This species, probably the most common of the huckleberries, ranges from Newfoundland to Manitoba and southward to Kentucky and Georgia. It is an inhabitant of rocky or sandy heaths and woodlands, but is not uncommon in swamps. Two botanical varieties are described: one with blue fruits which are larger, juicier, and covered with bloom; the other bearing a white huckleberry with translucent flesh. The white-fruited form is occasionally abundant and very fruitful.

The fruit of the black huckleberry is firmer than that of other species, which makes it a better berry for the market; it is not, however, so well-flavored as the dangleberry, to be described next. The pear-shaped huckleberry, passing under the name "sugar plum," belongs to this species. As with the blueberries, the plasticity of this species in the wild is certain indication that under cultivation superior varieties could be orginated by selection and hybridization.

2. *Gaylussacia frondosa,* Torr. & Gray. Blue Huckleberry. Dangleberry. Tangleberry. A slender shrub attaining a height of 6 feet, with smooth spreading branches. Leaves obovate-oblong, blunt or emarginate, pale green above, paler beneath, 1-2 inches long and half as broad. Flowers in slender, loose racemes with rather long slender pedicels; corolla globular, bell-shaped, greenish purple. Fruit dark blue with heavy bloom, sweet and pleasant.

The blue huckleberry is found in low copses on moist, peaty soils from New Hampshire to Florida and westward to Ohio and Louisiana. It is most common along the seaboard.

The fruit of the blue huckleberry is considered the best flavored of all the several species. The berries are sweet, but have a most agreeable piquancy which gives them, either fresh or cooked, a flavor unsurpassed by any other huckleberry or blueberry. In some regions the bush is not prolific, so that it is difficult to get a large supply of the berries, which are produced in sparse clusters that make picking difficult. The long, slender pedicels give the plant the name dangleberry. The blue huckleberry ripens later than the black huckleberry, from which it is easily distinguished by plant and fruit. It is much more adaptable to diverse conditions in the wild than the preceding species, and can probably be more easily domesticated.

3. *Gaylussacia ursina,* Torr. & Gray. Bear Huckleberry. Buckberry. This species is very similar to the preceding, differing in having some pubescence on the branches; leaves green on both sides, thinner and longer; flowers white or pinkish; and fruits black and shining; and having a more restricted range, being found in woods from Kentucky to Georgia and North Carolina.

The botanies speak of the berries of this species as insipid, but they are much used by the mountaineers in the region in which the plants grow for culinary purposes, and are said to have a peculiar flavor unlike that of any other blueberry or huckleberry. In the amelioration of huckleberries for the garden, this species might prove valuable for hybridization. Bears and deer feed on the ripened fruits,—hence the two common names.

4. *Gaylussacia dumosa,* Torr. & Gray. Dwarf Huckleberry. Dwarf shrub, 2 feet high, more or less hairy and glandular, from a creeping stem. Leaves obovate-oblong, mucronate, green on both sides, shining above, thick and leathery with age, 1-2 inches long, half as broad. Flow-

ers in loose, slender racemes, white or pinkish, with leaf-like, persistent bracts; ovary bristly and glandular; corolla bell-shaped. Fruit black, usually more or less pubescent.

The range of this species is from Newfoundland to Florida and Louisiana along the coastal plains. Its preference is for moist, sandy, or swampy soil.

The dwarf huckleberry is the least prepossessing of the huckleberries described, but the statements in the botanies that the fruit is insipid are misleading; under some conditions it is pleasant and most agreeable. The dull color, the rusty-brown, glandular hairs and the tough skin are the chief objections to the fruit, but these are removed by cooking, after which the berries are as palatable as any. However, the species is the least desirable of all for domestication, but may have value for coastal soils and for hybridization.

PART VII

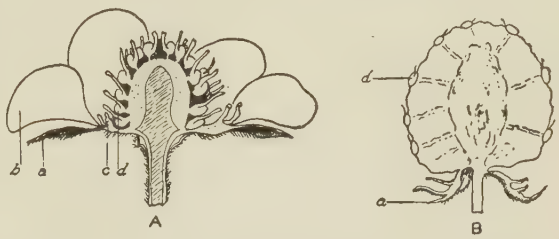
THE STRAWBERRY

CHAPTER XXIV

BOTANY OF THE STRAWBERRY

A strawberry is the juicy, edible, spurious fruit of any species of Fragaria, a genus belonging to the order of Rosaceæ. The fruit, as an esculent, is spurious because the edible part is the receptacle which terminates the flower-stalk, the true fruits being the dry achenes borne on the enlarged receptacle. This fruit-like receptacle, when ripe, is a solid, round, pulpy, cone-shaped structure, usually red, about the base of which is a flat rim to which were attached the floral and reproductive organs. Fig. 293 shows the strawberry flower and fruit. The flowers of the strawberry are in varying degrees polygamo-dicœcious, cross-pollination being usually brought about by insects. In many cultivated varieties the flowers lack stamens, and fruits do not develop unless pollen is brought from another flower.

The strawberry plant is a low, stemless perennial, propagated from stolons which spread over the surface of the ground. The white flowers are borne in cymes on more or less erect scapes. The radical leaves are made up of three leaflets which are obovate-wedge-form and coarsely serrate. The fruits ripen in late spring or early summer, with sometimes a second crop in the autumn. With this simple outline of the botany of the strawberry in mind, we are ready to discuss the character and growth-habits of the plant which are of importance to pomologists.



293. Flower and fruit of strawberry. A—Section of strawberry flower; B—Section of strawberry fruit. *a*. Sepal; *b*, petal; *c*, stamen; *d*, carpel.

For descriptive purposes the strawberry-plant may be divided into root, stolon, leaf, flower, and fruit. The strawberry-grower must know the gross structure of these organs, not only that he may identify species and varieties, but also that he may propagate, transplant, and otherwise care for the plants properly. He must know the several species and something of their origin, history, and habits of growth, that he may understand their adaptations to soils and climates, their relation to strawberry pests, and for what purposes they are best adapted. Although the plant is a complex organism, and the species are closely related, the pomologist has little difficulty in distinguishing the parts of the plant, and in separating the species with which he is concerned.

CHARACTERS OF THE PLANT

The four species of Fragaria with which strawberry-growers are concerned have very characteristic plants, and many varieties are distinguished by the aspect of the plant. The character most in evidence in giving aspect is size. Is the plant tall or dwarf, compact or spreading? Size and vigor must be distinguished; a large plant may lack vigor and a small one have it. Habit of growth goes far toward giving aspect to the plant. Thus, the radical leaves may stand upright or take a drooping position; the plants may be open or compact; some plants grow rapidly, others slowly. All of these are reliable characters in identification, when proper allowance is made for care and environment. They are of importance, also, in determining how far apart the plants should be set, the method to be adopted in laying out the plantation, and the care the plants are to receive.

Species and varieties differ much in ability to make new plants. One of the marked characteristics of *F. chiloensis,* characters of which are found in the lineage of most cultivated varieties, is its ability to reproduce rapidly. Not only are numbers of new plants to be noted, but account must be taken of the manner in which the plants are borne.

The stolons or runners extend horizontally over the surface of the ground, bearing buds, which become fixed in the ground, and from which develop shoots and roots. The number of plants depends on the number and vigor of the buds. Varieties to be planted in dry or hot regions must have roots which penetrate deeply into the soil. The number of plants a variety makes helps to determine the distance apart to set the plants; this number varies from one or two to forty or fifty.

Runners vary much in the character of the internodes. Some runner cords are thick and stout or even fleshy, others long and slender and wiry. Runners with short internodes may

strike three or four inches from the plant; with long internodes, twelve or fourteen inches. The length to be desired depends on the method of training, whether in hill, matted-row, or hedge-row.

The constitution of the plant.

By constitution is meant vigor, hardiness, productiveness, and resistance to disease. The ideal strawberry must be vigorous, hardy, productive, and immune to diseases in the regions in which it is grown. The constitution of a plant can be determined only after observations extending over two or more seasons.

Vigor is a relative term as commonly used, since it depends on character of soil, food-supply, rainfall, and temperature as well as on a character in the variety itself. Vigor, as the word is used here, is an inherent character of a variety and must not be confused with health; manifestly a variety inherently vigorous may make a weak growth when in ill-health. Vigor of top is often correlated with a large or deeply penetrating root-system. Strawberries are described as vigorous, of medium vigor, or weak.

Hardiness must be considered in selecting varieties, and is sometimes helpful in determining the identity of a strawberry. Under hardiness must be included ability to withstand heat as well as cold; adaptability to dryness and wetness of air and soil may well be considered under hardiness also. Soil and care have much influence on the degree of hardiness. Varieties are described as *hardy, half-hardy,* or *tender.*

Productiveness is a distinctive character of strawberries, and is one of prime importance to the grower. Productiveness is influenced by every condition of environment; but, on the other hand, varieties under seemingly identical conditions produce widely varying amounts of fruit. The record yield east of the Rocky Mountains seems to be 16,000 quarts to the acre; in California, a record of 40,000 is reported. Yield is usually denoted by the terms very productive, productive, and unproductive.

Varieties exhibit widely varying capacity to resist diseases and insects, some sorts being wholly immune to this or that pest, while others under the same condition are so susceptible as to be worthless. Leaf-blight is the trouble from which growers most desire immunity in a variety. It is difficult to make sure whether a variety is inherently immune or is so for a season because of conditions unfavorable to the pest, therefore observations must be made over several seasons. Few growers spray strawberries, hence the importance of disease-resistance as an inherent character in a variety.

The foliage.

The size, shape, color, texture, and markings on the surfaces of leaves are quite distinctive of species and varieties of strawberries. The leaf-stem in different varieties varies from long to short and from stout to slender. The leaves of some varieties are erect and those of others prostrate; the latter are not to be desired, since they are more likely to be infected by mildew, mold, and leaf-blight, and the flowers are not so well protected from frost.

The size of the leaf is a good diagnostic character; large size usually denotes vigor. Thickness is also a good distinguishing mark. Thick leaves are desirable because they are not so badly torn by wind nor scorched by sun. The thin leaves of European strawberries usually suffer in the scorching sun of the New World. Leaflets in different varieties vary greatly in shape and color, some being nearly round and others almost lanceolate; in color, the variations run from yellowish-green to very dark green.

The flower.

Very plain marks of distinction between varieties are found in the reproductive organs. The flowers may be perfect, semi-perfect, or imperfect. The flowers of most varieties are perfect, since it is troublesome to find pollenizers for sorts with imperfect flowers. Some growers believe that varieties with imperfect flowers are more productive and less tender to cold.

The time of flowering is important in classification. Relative time varies but little in varieties, so that blooming season is a safe mark of distinction. This life-event is important to the grower because early-blooming sorts may be caught by frosts in cold climates. Season of bloom is denominated as early, medium, or late. The difference between early and late may range from two or three days to three weeks. There is no correlation between blooming-time and ripening-time.

The stem of the flower offers several valuable distinctive marks. Thus, it may be long or short; stout or slender; erect, semi-erect, or prostrate; single or branching. It is of advantage that a variety have stout, erect fruit-stalks that hold the berries off the ground and that are not easily broken by pickers. On the other hand, it is not desirable that the flower-stalk rise above the foliage, where flower and fruit would be exposed to frost, beating rains, and scorching suns.

There are marked variations in varieties in the size, color, and position of the calyx, but not much variability in this structure in berries of any one variety. The calyx may be large or small; raised on the neck of the berry, attached to the flat base, or sunken into the fruit; may be leaf-like or bract-like; bright, dull, or dingy green; and may part from the fruit easily or with difficulty. It is desirable that the calyx be large, bright in color, and that it part readily from the fruit. Now and then a so-called *shuckless* variety is found in which the calyx remains on the plant when the berry is picked.

The fruit.

The first character of the fruit to be noted is the season of ripening, the terms *early, midseason,* and *late* being used to denote time of maturity. Varieties usually follow the same order in ripening, but they may not do so, the exception being in seasons of extreme heat or cold. It is impossible to give the relative time of ripening for fall-bearing varieties, so great is the variability of these sorts. Environment and care greatly affect the time of maturity. Varieties ripening very early or very late are seldom heavy yielders. The length of the ripening season and the number of pickings vary greatly with different varieties.

The size of berries is so variable as to be rather unreliable for purposes of identification; however, the fruits of some varieties run uniformly small and of others, large. For home and local markets, varieties having berries of large size are most desired, while for distant shipments berries of medium size are best, since they do not bruise so badly in handling. Some sorts bear large fruits at the first picking, after which the berries run small—an undesirable character.

Shape of fruit is a valuable distinguishing mark. The commonest shapes are conic, oblong, oblate, round, and wedge-shape; usually it requires a combination of these terms to describe the character. Occasionally obovate berries are found. Varieties with fruits of cockscomb shape are rather common, and berries of any of the shapes given may have a neck. Some berries are furrowed. Usually the fruits of a variety are markedly regular or irregular.

The apex of the berry in different varieties may be pointed, obtuse, indented, green-tipped, hard, or soft. Round berries without a prominent tip are now most desirable.

Seeds may be large or small, few or many, raised or sunken, brown or yellow. Seedy berries are unattractive; therefore the seeds in a good fruit should be few and small. Yellow seeds are more attractive than darker ones. The flesh is better protected when seeds are raised than when sunken; therefore berries with raised seeds carry to market better.

The color of strawberries varies from white to red and from red to dark maroon. Nearly all varieties now under cultivation may be described as *light red, medium red* and *dark red,* to which terms the prefix *dull* or *glossy* will often have to be applied. The color may be marbled or uniform. Dark red varieties are now preferred. White varieties are usually blushed with pink. Dark-colored berries show bruises less than light-colored ones. A white tip is a defect.

The color of the flesh is almost as much a standard means of identification as the color of the surface. The flesh is usually described as the same as the surface, lighter than the surface, or darker than the surface. The flesh is whiter toward the center in some varieties. Dark red flesh is most to be desired, while white is the most objectionable color. The red color of the flesh must persist in canned strawberries to obtain a well-finished product.

Texture and juiciness of pulp are so variable as to have little value for descriptive purposes, but are important characters to the grower. For shipping or for canning, the berries must be firm. The flesh may be dry or juicy, coarse, fine-grained, or stringy, and the core may be hollow, hard, or soft. Hard, stringy cores are objectionable. "Fig strawberries" are those so sweet and dry that they may be sun-dried, and so make a fig-like product.

The flavors are *sweet, neutral* or *flat, subacid, tart,* and *sour.* These flavors may be qualified by such terms as *rich, highly flavored, sprightly* and *mild.* All strawberries are more or less aromatic. Subacid sorts are in greatest demand. Climate greatly modifies flavor as does soil, although to a much smaller degree.

Quality in a strawberry is that combination of color, flavor, aroma, and texture which pleases the several senses. Quality is described as *best, very good, fair, poor* and *very poor.* For the reason that quality is variable, and because tastes vary, quality is of little importance in identifying varieties, but manifestly is a character the grower must always consider. Upon quality largely depends the classification as to use of a variety, whether for dessert or culinary purposes.

The description blank for the strawberry on the next page sets forth most of the characters students and fruit-growers will use in describing strawberries.

SPECIES OF STRAWBERRIES

The genus Fragaria is widely distributed, no continent or large body of land being without an indigenous species. While Fragaria grows most abundantly in temperate climates, yet forms are found in the tropics, and, if not in arctic regions, at least to their very borders. Thus widely diffused, the species are exceedingly variable, and no fewer than 150 names have been applied to the different forms. Fortunately for nomenclature, horticulturists can agree that cultivated forms came from four species-types.

1. *Fragaria virginiana,* Duchesne. Scarlet Strawberry. Virginian Strawberry. Plant small, slender, erect, with slender, wiry, rather deeply-set roots; runners numerous, long, appearing with and after the blossoms. Leaves radical; leaflets rather large, thin but leathery, light green, tomentose when young, glabrous at maturity, three, obovate-wedge-form, coarsely serrate. Flowers and flower-clusters small; borne in a few-flowered cyme at the top of a rather long, slender, weak, slightly villous scape; calyx of medium size or rather small. Fruits early, small; globular or oblong-conical, usually markedly necked; color light scarlet, sometimes white; flesh usually pink, sprightly acidulous, aromatic; seeds yellow, sunken deeply in angular pits.

DESCRIPTION BLANK FOR THE STRAWBERRY

Name..... Plat..... Row..... Date..... 19....

PLANTS

Characteristics .....
Numerous, medium, few
Vigorous, medium, weak
Tall, medium, dwarf
Very productive, productive
Medium productive, unproductive
Spring-bearing, everbearing

SUSCEPTIBILITY to

Insects .....
Diseases .....

RUNNERS thick, medium, slender
with long, medium, short internodes.

LEAVES

Large, medium, small
Light, medium, dark green
Rugose, smooth
Glossy, dull

PETIOLE thick, medium, slender

FLOWERS

Perfect, semi-perfect, imperfect
Date of bloom .....
Early, medium, late
Length of blooming season.....
Size: diameter .....
Large, medium. small

Petals

Number .....
Large, medium, small

Stamens

Numerous, medium, few, none

Receptacle

Large, medium, small

Fruit-stems

Long, medium, short
Thick, medium, slender
Erect, semi-erect, prostrate

Pedicels

Long, medium, short
Thick, medium, slender

FRUIT

Characteristics .....

SEASON

Early, midseason, late

DATE OF RIPENING .....

LENGTH OF SEASON .....

PICKING QUALITY .....

SHIPPING QUALITY .....

Large, medium, small
Retains size, drops in size
Uniform..... variable.....
Regular, irregular, furrowed
Oval, conic, roundish
Oblong, oblate, wedge
Cockscomb, necked

APEX

Pointed, obtuse, indented
Green-tipped
Hard-undeveloped

SURFACE COLOR

Light, medium, dark red
Dull, glossy
Unattractive, attractive
Colors evenly or unevenly

CALYX

Large, medium, small
Raised, flat, depressed
Reflexed, leafy
Color .....
Adherence to fruit .....

SEPALS

Long, medium, short
Broad, medium, narrow

SEEDS

Numerous, medium, few
Raised, sunken

FLESH

Light, medium, dark red
Whitish toward center
Juicy, medium, not juicy
Stringy, firm, medium, tender
Sweet, subacid, sour
Sprightly, high-flavored, aromatic

QUALITY

Best, very good, good
Fair, poor, very poor

USE

Dessert, kitchen, canning
Market, home

DESIRABILITY .....

REMARKS.....

.....

.....

Probably no other fruit grows wild under such varied conditions and over such an extended area in North America as this wild strawberry. It is found in every state in the United States, in the mountains of Mexico, and far north into Canada. Naturally plastic, when spread over this vast territory the species runs into many forms, several of which have received specific names from one or another botanist. Among these, var. *illinoensis,* Gray, a larger, more robust plant with scapes and pedicels more hairy, and larger berries, is the only one which has noteworthy pomological characters different from those of the species.

This species has been more or less cultivated almost from the settlement of North America. It was mentioned by Parkinson as under cultivation in England in 1629, though it was little improved either at home or in Europe until early in the nineteenth century. About 1820, several improved varieties made their appearance, such as Early Hudson, Hudson's Bay, Methven Scarlet, Large Early Scarlet, and Crimson Cone. These and other varieties of this species held the markets until the middle of the century, when improved hybrid sorts began to take their places. It is probable that no pure-bred variety of this species is now under cultivation.

2. *Fragaria chiloensis,* Duchesne. Common Garden Strawberry. Pine Strawberry. Plant large, low, stocky, with rather thick, fleshy, shallow roots; runners moderate in number, short, stout, appearing after the fruit has matured. Leaves radical; leaflets three, large, obovate-wedge-form; round-toothed; thick, leathery, smooth and glossy above, tomentose below; strongly reticulate. Flowers white; borne in loose cymes on more or less erect, silky scapes; calyx very large, often leafy. Berry large, globular or conic, firm; dark-red; more or less hairy; sometimes slightly necked; flesh white, with a hollow core; flavor mild, musky; seeds brown, raised or in shallow pits.

This is the common wild strawberry from Alaska to California in North America, and from Peru to Patagonia in South America. As would be expected from its great range in latitude, there are many marked variations. The North American form has as yet given no valuable varieties, although it has been used in breeding work by several workers, but the South American form is represented in the lineage of nearly all varieties now cultivated in America. To the Chilean strawberry, in particular, we are indebted for the large size of modern strawberries. The Pine, most notable in the early history of the large-fruited strawberries we now grow, called by many botanists var. *ananassa* of *F. chiloensis,* is probably a cross between this species and *F. virginiana.*

This strawberry was introduced into France in 1712 by Frezier, a French officer, who found it in Chile, both wild and cultivated. In 1727, it was introduced into England, but seems not to have found general favor. The Pine strawberry, the name referring to the pineapple fragrance, now considered the progenitor of our cultivated varieties, made its appearance in Europe about the middle of the eighteenth century, but its origin must ever remain a mystery; as has been said, it is now generally agreed that it is a hybrid. One of the first of the large-fruited strawberries was Keene's Seedling, of the Pine strain, originated by an Englishman in 1819. Soon after, this and similar large-fruited varieties were introduced in America, and the culture of this group of strawberries was begun in the New World. Prince says that the Large Scarlet Chile was imported to this country from South America at about the same time, 1820.

3. *Fragaria vesca,* Linn. Alpine Strawberry. Perpetual Strawberry. Wood Strawberry. Plant rather tall, erect; runners long, slender, rather numerous. Leaves radical; leaflets thin and light green as compared with the foregoing species; silky when young, glabrous at maturity; margins serrate, the teeth very sharp. Flowers small, borne irregularly in loose racemes on weak, erect scapes longer than the leafstalks; calyx small and recurved. Berries small, firm, round, or round-conic, sometimes pointed; flesh white, rich and delicate, aromatic; seeds small, many, prominent, raised.

This is the wild strawberry of the Old World, which apparently passes without sharp demarcation into var. *americana,* Porter, of the New World. The American form is more slender, with thinner leaves, with more ovoid or conical fruits, which are usually more distinctly necked; its petioles and scapes are sparingly hairy rather than hairy-pubescent. The true *F. vesca* is found as an escape from the garden in eastern United States. The species is found in all parts of the north temperate zone in the Old World, while the New World form is found from Newfoundland to North Carolina and westward to the Great Plains. There are no valuable varieties of the American form under cultivation, but the type species is the strawberry of the ancients in the Eastern Hemisphere.

This is the strawberry mentioned by ancient writers as a wild plant, but, while possibly cultivated in the medieval period, seems not to have been considered a garden plant until the sixteenth century, when it began to appear in all European books on cultivated plants. Until the advent of *F. chiloensis* and *F. virginiana* to garden-culture in the eighteenth century, this was the chief if not the only cultivated strawberry in Europe. No variety of this species has ever attained prominence in America, although the type was introduced in the colonies as early as 1750.

4. *Fragaria elatior,* Ehrh. Hautbois Strawberry. This species of Europe differs from *F. vesca* in its taller and more pubescent plants which bear flowers that are usually dioecious. The berries differ in being rounder, larger, a paler red, with the calyx more strongly reflexed from the fruit, and in having a distinctive strong musky flavor; they are, also, borne on longer, stouter stems which elevate them above the foliage.

The habitat of the Hautbois is central Europe, where it is a common inhabitant of the woods, although sometimes found in open fields. It does not grow wild in North America as a native, but is occasionally reported as an escape from cultivation. In spite of the fact

that it was early cultivated in Europe, it is now of small importance as a cultivated plant, chiefly because of its unproductiveness and its diœcious flower. The species is unimportant in American strawberry-culture.

EVERBEARING STRAWBERRIES

Under some conditions of temperature and moisture, nearly all varieties of strawberries bear fruit from early summer to late autumn. Thus, in the Gulf states and on the Pacific slope, the season of most varieties may be made to extend over several months. This tendency is much more marked in certain varieties, and in some of these the season is extended, or at least a fall crop is produced in the North and East. These everbearers of the East, having the everbearing character fixed, constitute a distinct strain. They are descendants of Pan American, which originated in 1898 with Samuel Cooper, Delevan, New York. Whether Pan American originated as a bud-sport or from a seed is in doubt. There are now a score or more so-called everbearers of more or less value.

The Alpine strawberry, *F. vesca,* of Europe, often gives everbearing varieties which are cultivated in Europe, but these are so unproductive, and the berries run so small that they find little favor in America. With these Alpine varieties, as with varieties of common cultivation, much depends on climate as to whether the season may be extended or a double crop harvested.

Of the many everbearing strawberries introduced in this country, only the following are considered sufficiently well established to warrant description in this text: Americus, Pan American, Peerless, Progressive, and Superb.

CHAPTER XXV

VARIETIES OF STRAWBERRIES

The strawberry has been under cultivation in America but a short time, the commercial industry having begun with the introduction of the Wilson in 1854, but progress in improving varieties has been so rapid that the number of sorts introduced in America exceeds 2000. Comparatively few of these are now under cultivation, for the list of varieties changes every ten or fifteen years. In 1920, nearly 300 varieties were listed for the United States and Canada. In every part of the continent in which diversified agriculture is practiced, strawberries are grown; no other fruit is more widely distributed. The growing of strawberries is a great commercial industry of the country, and each region in which fruit-growers specialize in this fruit has a list of varieties suited to its needs. In this chapter, a special effort is made to give the adaptations of varieties to these regions of commercial cultivation. The strawberry is the most popular fruit for home fruit-gardens, and to fulfill its potentialities for the garden the grower can choose a great assortment of the kinds described.

ABINGTON. The variety is worthy of trial for its productive vines and handsome fruits, which retain their size well throughout the season. The foliage is reported to be susceptible to leaf-spot. It was introduced by L. Blanchard, Abington, Massachusetts, in 1905. It is much grown about Boston.

Perfect. Plants many, vigorous, very productive; leaf large, dark green; leaf-stems long; fruit-stems long, thick, usually double, erect; blooms medium early; calyx of medium size, flat or often on a short neck, sometimes slightly discolored. Fruit large, midseason, easily picked; wedge to round-conic or sometimes slightly elongated, attractive light scarlet; flesh light colored, firm, mildly acid, fair to good in quality; seeds sunken.

AMANDA. Amanda is recommended for trial, both for home and commercial purposes. The plants are vigorous and productive, and produce runners in great numbers, but are somewhat susceptible to leaf-spot under unfavorable conditions. The blossoms are perfect and open in midseason or later. The berries ripen in midseason; are large, and hold up remarkably well throughout the ripening season; in color, they vary from light to dark scarlet, depending on the stage of maturity, and are always glossy and attractive; in shape, the berries are blunt-wedge, although round-conic forms may be found among them. The flesh is firm enough to stand distant shipments, and its color is good to the very center. There is enough acidity of flavor to give sprightliness, which, combined with other characters, makes the variety rank high in quality. This variety was originated by Z. T. Mumma, Blufftown, Ohio, in 1904.

Perfect. Plants very numerous, vigorous, somewhat susceptible to leaf-spot, very productive; leaves of average size and color; leaf-stalks long, thick, branched, erect; calyx of medium size, sometimes somewhat discolored, sunken or flattened. Fruit midseason; large, retains its size well to the close of the ripening period, wedge-shaped to roundish-conic, glossy, light to dark scarlet; flesh well colored to the center, very firm, pleasantly acid, agreeably flavored; good in quality; seeds strongly depressed.

AMERICUS. This is a rather remarkable everbearing strawberry in that the runner plants often begin to bear as soon as they start root. The plants yield a fair crop in June, and, if conditions are favorable, continue to bear until November. The quality of the berries is excellent. The variety is liked for hill culture in home-gardens. It originated in 1905 with Harlow Rockhill of Iowa and was introduced in 1912.

Perfect. Plants hardy, vigorous, deep-rooted; leaves rather few, exposing the berries somewhat; fruit-stems long; runners rather few. Fruits medium to large, firm, light red often with a green tip; flesh light red, mild subacid, large, aromatic; quality the best of any everbearer.

ARIZONA. *Arizona Everbearing. Mexican Everbearing.* Arizona is a comparatively old sort which was long the leading variety in the Pacific Southwest, where resistance to heat and drought is important. It is still grown to some extent in Arizona and southern California. The variety was introduced about 1890. Improved Arizona is identical with Arizona.

Perfect. Plants vigorous, healthy, make but few runners. Fruits midseason, of medium size, globose-conic; light red in color with light red, soft flesh; mild subacid; quality good.

AROMA. *Cycloma.* A commercial variety in the Middle West from Missouri and Kentucky to Wisconsin and Michigan, Aroma is also grown in Ohio, in West Virginia, and as far east as Delaware. The plants are resistant to disease, very productive; and are adapted to a variety of soils, although they prefer clay and silt loams. The berries keep and ship well, are attractive in appearance and of high dessert quality. Aroma originated with E. W. Cruse, Leavenworth, Kansas, about 1889.

Perfect. Plants vigorous, healthy; make runners freely; calyx medium, adherent. Fruit midseason to late, large, globose-conic or short wedge-shaped, firm; bright crimson with light red flesh; mild subacid, core white, solid; quality good; seeds prominent.

BEDER WOOD. This is an old variety once much grown in the Middle West and as far east as western New York. It is now being discarded because the fruits are small. not very firm, and rather poor in quality. It does best on heavy soils. The variety originated with a Mr. Beder Wood, Moline, Illinois, in 1881.

Perfect. Plants of medium size and vigor, very productive but somewhat subject to leaf-blight; runners numerous; leaves small; blooms very early; fruit-stems medium length. Fruit early midseason, of medium size or small, globose or globose-conic, rather soft; crimson on the surface with lighter colored flesh; brisk subacid; quality fair; seeds sunken.

BRANDYWINE. At one time much grown in the East, Brandywine is now discarded because the plants are very susceptible to leaf diseases; it is still one of the leading varieties about Los Angeles, California, where the berries are produced from early spring to late autumn. The variety originated with E. C. Ingram, West Chester, Pennsylvania, about 1889.

Perfect. Plants vigorous, productive, susceptible to leaf-spot; runners very abundant; fruit-stems long, erect; calyx large and unattractive. Fruit late, large, broadly globose-conic, firm; color deep crimson with dark flesh; core hollow; brisk subacid; quality good to very good; seeds numerous, yellow, conspicuous.

294. Bubach. (×¾)

BUBACH. Fig. 294. *Western Union.* Bubach was a standard sort a quarter of a century ago but is now being discarded because the plants are not good plant-makers, and the berries are soft and irregular in shape; the plants are very productive, however, and the berries are large, handsome, and of very good quality. Bubach originated with L. G. Bubach, Princeton, Illinois, about 1882.

Imperfect. Plants vigorous, healthy, productive, do not make sufficient runners; fruit-stalks short, weak. Fruit midseason, large, round wedge-shaped, ribbed, irregular; glossy bright crimson on the surface with red flesh; flesh rather soft; mild subacid; quality good to very good; seeds large, even with the surface.

CAMPBELL. Fig. 295. *Campbell's Early.* Prized for its great productiveness, Campbell, a comparatively new sort, is being largely grown in New Jersey. The fruits are large, inviting in appearance and taste, very uniform in shape, and ship particularly well. Campbell was introduced by W. B. Kille, Swedesboro, New Jersey, in 1916.

295. Campbell. (×¾)

Perfect. Plants very vigorous, healthy, making many runners. Fruit early, medium to large, retains size throughout season; globose to globose-conic; rich crimson color; flesh firm; subacid; quality very good; seeds large, yellow.

CHESAPEAKE. Fig. 296. Chesapeake is one of the most promising of the new strawberries. It has several distinctive characters, chief of which are vigor and healthfulness of plants, and beauty and attractiveness of fruit. The plants do not multiply so rapidly as those of most varieties, and therefore should be set somewhat thickly. There is but little danger of frost with this variety, as the plants bloom late, a valuable consideration in some localities. The large, leafy calyx is well-colored, and adds to the attractiveness of the

296. Chesapeake. (×¾)

fruit. The surface of the berries is characteristic of the variety, being unbroken by furrows or irregularities and unusually plump and glossy. The dark red flesh is aromatic, mildly acid, and very good to best in quality. This variety originated with J. W. Parks, Nanticoke, Maryland, about 1904.

Perfect. Plants few, vigorous, usually healthy but with a tendency to mildew, productive; leaves above

medium in size, wide, thick, usually branched, semi-erect; season of bloom late; calyx large, leafy, attractive green, slightly depressed. Fruit midseason or later, easily picked, ships well; berries large, dropping in size as the season advances, round-conic to wedge-shaped, the surface plump, unbroken by furrows or by irregularities, with conical apex which becomes seedy in appearance in the smallest berries, beautiful glossy scarlet; flesh very firm, variable in color, mildly acid, juicy, pleasant flavor; very good to best in quality; seeds conspicuous, often markedly raised, numerous.

CHIPMAN. This new variety is now the leading strawberry in the Virginian part of the Chesapeake Peninsula. Earliness and productiveness are the two characters that make it valuable. It was introduced in 1907 by W. S. Todd, Greenwood, Delaware.

Perfect. Plants very numerous, vigorous, healthy, productive; leaves of fair size, dark green; leaf-stems medium to long, slender; fruit-stems long, thick, often branched, prostrate; blooms early; calyx large, sometimes leafy, light green, flat. Fruit large, early, wedge-shaped or round-conic, sometimes elongated, surface irregular, light and dark scarlet, becoming duller as the season advances; flesh light in color, medium in firmness and juiciness, mild acid, pleasant but not high flavor; fair to good; seeds sunken.

CLARK. Fig. 297. *Clark's Early. Early Idaho. Hood River.* Clark is a standard variety in the Pacific Northwest, being grown almost exclusively in the Hood River and White Salmon regions of Oregon and Washington. It has little or no value in other regions. The plants require much moisture, and except under irrigation are seldom productive. The berries have the reputation of standing shipment better than those of any other variety, and are liked by canners because of their firm, red flesh. The variety originated in Portland, Oregon, with F. E. Clark, about 1880.

297. Clark. (×¾)

Perfect. Plants vigorous, healthy, erect, make runners freely; leaf- and fruit-stems short. Fruit midseason, of medium size, globose or globose-conic, very firm; color dark crimson with dark red flesh; brisk subacid or acid; core solid; quality good; seeds bright yellow, raised.

COLUMBIA. Strawberry-growers are finding that Columbia is a valuable variety in regions to which the better-known Chesapeake is adapted. The fruit is handsome and of best quality, and the foliage shows few faults. Home gardeners esteem the variety more highly than commercial growers. It originated with J. B. Wild & Brothers, Sarcoxie, Missouri, about 1900.

Imperfect. Plants very numerous, vigorous, healthy, productive; leaves unusually large, dark green; leaf-stems long, very thick; fruit-stems long, thick, often single, erect; blooms late; calyx large, often leafy, usually sunken. Fruit large, late, wedge-shaped or round-conic, glossy, light scarlet; flesh well colored, firm, agreeably acid, pleasant flavor; good to very good in quality; retains size well as the season advances; seeds raised.

CRESCENT. Fig. 298. Long one of the standard strawberries, Crescent is still to be found in the eastern states in gardens and now and then in a commercial plantation. Its great merits are productiveness, even on poor land and under neglect, and strong, vigorous plants which make many runners. The plants rust badly, however, and the berries are deficient in color, firmness, and quality. The variety originated in 1870 with William Parmalee, New Haven, Connecticut.

298. Crescent. (×¾)

Imperfect. Plants tall, vigorous, productive; runners very numerous; fruit-stalks erect, branching. Fruit early midseason, of medium size, round-conic usually with a depression in the apex, bright scarlet; calyx recurved, easily detached; flesh light red, medium in firmness; core solid pink; flavor subacid, mild, aromatic; quality fair; seeds numerous, slightly raised.

299. Dr. Burrill. (×¾)

DR. BURRILL. Fig. 299. Dr. Burrill is most promising in its plants, but rather disappointing in the quality of its berries, which,

however, are large and well colored. Nevertheless, the variety is well worth further trial as a late midseason sort, its period of probation by no means being ended. Berry-growers in southern Illinois find it a very acceptable new sort. Dr. Burrill originated with J. R. Reasoner, Urbana, Illinois, and was introduced in 1916.

Perfect. Plants numerous, intermediate in vigor, healthy, productive; leaves rugose, glossy; flowers early midseason; fruit-stems raised, with reflexed sepals, attractive green. Fruit late midseason; large, regular, conical, strongly necked, medium to dark red, glossy; apex pointed; flesh medium red throughout, variable in juiciness and flavor, firm, subacid; quality fair to good; seeds sunken.

DOLLAR. This is an old sort long since discarded in the East, but now one of the leading varieties near Sacramento, California, where it is remarkable for its firm, handsome berries and for plants that bear productively from the middle of April to late summer or autumn. Dollar originated with O. F. Felton, Merchantville, New York. The variety is distinct from Gold Dollar.

Perfect. Plants vigorous, healthy, make runners freely, productive. Fruit midseason to summer and autumn, large, globose-conic; color attractive red on the outside with red flesh; flesh firm, shipping and keeping well; subacid and well flavored; quality good to best; seeds prominent.

DUNLAP. Fig. 300. *Senator Dunlap.* The high quality and handsome appearance of the berries make Dunlap a great favorite for the garden and local markets in the northern states east of the Rocky Mountains. In the northern Mississippi Valley, it is grown almost exclusively. Besides the characters named for the fruits, the variety has to its credit hardy, healthy, productive plants. Dunlap originated with J. R. Reasoner, Urbana, Illinois, about 1890.

300. Dunlap. (×¾)

Perfect. Plants very numerous, vigorous, healthy, very productive; leaves of medium size and color; leaf-stems long, slender; fruit-stems long, slender, usually single; blooms in midseason; calyx large, reflexed, usually on a slight neck. Fruit very large, midseason, drops in size as the season advances, round-conic or elongated, often with a neck, glossy, light and dark scarlet; flesh well colored, firm, mild, pleasant flavor; quality good; seeds large, sunken.

EARLY HATHAWAY. *Texas.* For many years Early Hathaway was grown more or less in northern Alabama, southern Kentucky, and Maryland, but it is losing favor in these regions, as the fruits are not well enough colored or firm enough for distant shipping. The variety originated in Arkansas, about 1892.

Perfect. Plants vigorous, healthy, make runners freely, very productive. Fruit early, or medium size, globose-conic; scarlet with light red to white flesh; flesh firm, brisk subacid; quality fair.

ECHO. In the Falmouth berry region of Massachusetts, Echo is much grown, being prized for productiveness, for stout stiff stems which hold the fruit off the ground, and for the excellent shipping qualities of the berries. It was introduced by the Woodlawn Nurseries, Rochester, New York, in 1907.

Perfect. Plants vigorous, productive; leaves light green; leaf-stems of fair length, slender; fruit-stems long, thick, usually double, erect; blooms in midseason; calyx large, often leafy, slightly sunken. Fruit large, drops in size as the season advances, round-conic, apex very blunt, dull scarlet; flesh whitish, juicy, firm, pleasant flavor; good to very good in quality; seeds sunken.

EXCELSIOR. This old sort, long grown in many parts of the United States, is still a standard in Arkansas and southern California. Excelsior is prized in the regions named for berries that ripen early and ship well, although they have the fault of small size after the first picking. In some localities the plants are so unproductive that the variety is not profitable. Excelsior originated with Louis Hubach, Judsonia, Arkansas, in 1890.

Perfect. Plants medium in number and vigor, healthy, not very productive; leaves light green; leaf-stems of average length, slender, usually double, prostrate; blooms early; calyx small, often discolored, sunken. Fruit medium to small, early, round-conic, often blunt at apex, dark scarlet when well ripened; flesh well colored, firm, tart, hardly good in quality; seeds numerous, depressed.

FORD. This is a new strawberry which gives promise of being one of the best late varieties. The berries are very large, attractive dark red, and of most excellent quality. Another valuable asset is lateness in blooming, whereby spring frosts are escaped. Ford is a chance seedling found by Granvill Brewington, about 1913, in Winomico County, Maryland.

Perfect or semi-perfect. Plants numerous, extremely vigorous, healthy, very productive; leaves of largest size, very thick, markedly dark green, rugose; flowers very late; fruit-stems very long, thick, erect, branching into many long pedicels; calyx unusually large, flat, very leafy, attractive green. Fruit very late, of largest size, regular, blunt-wedge to blunt-conic, attractive, glossy, medium to dark red, coloring somewhat unevenly; apex obtuse; flesh red throughout, unusually juicy, firm, mild, sweet; quality good.

GANDY. Fig. 301. *Gandy's Prize. First Season.* Gandy has long been a standard sort in parts of Maryland, Delaware, and New Jersey, and is more or less grown throughout northern United States. Its outstanding qualities are: handsome, deep red, firm fruit of very good quality; and late season, reaching the

301. Gandy. (×¾)

market at the very close of the strawberry season. The berries are liked by canners and for culinary purposes in the home. The plants require moist, heavy, clay soils to produce sufficiently well; they should be fruited but one season. Gandy originated with W. G. Gandy, Newport, New Jersey, in 1885.

Perfect. Plants vigorous, low, spreading, somewhat susceptible to disease, productive, make runners freely; fruit-stems long and prostrate; calyx large, easily detached. Fruit late, large, globose-conic, irregular; color deep crimson; flesh firm, late, brisk subacid; quality good; core hollow; seeds numerous, raised.

GLEN MARY. Once widely and commonly grown, Glen Mary is still prized in New York and New England for its exceedingly productive vines and its handsome, well-flavored fruits. Several faults mar the variety: the fruit-stems are too slender to hold the fruit off the ground; the foliage is susceptible to leaf-spot; the plants thrive only on very heavy and enriched soils; and the blossoms are not entirely self-fertile. The variety originated with J. A. Ingram, East Bradford, Pennsylvania, in 1896.

Partially perfect. Plants rather small, spreading, fairly vigorous, somewhat susceptible to rust; runners moderate; leaves small, leaf-stalks slender; fruit-stems slender, long, prostrate; calyx of medium size, flat, often discolored. Fruit midseason, medium to large, conic, sometimes necked, irregular; color dull crimson often with white tips; flesh red, rather soft, subacid; core solid; quality good; seeds large, raised.

GOLD DOLLAR. Unprofitable elsewhere for home or market, Gold Dollar is one of the leading early varieties in Oregon. Both vines and fruit please the Oregon growers. The variety originated in Oregon about 1906 and rapidly found favor.

Perfect. Plants vigorous, fairly productive, healthy, make runners freely. Fruit early, medium to large, globose-conic; color dark crimson; flesh rather soft, red to the center, mild subacid; quality only good.

302. Good Luck. (×¾)

GOOD LUCK. Fig. 302. Growers agree that Good Luck ranks among the best new late strawberries. Its fruits are distinguished by flesh so firm that they are hardly surpassed in standing transportation. Another outstanding character is that the plants are not susceptible to leaf-spot. The fruits are large, handsome, and very good in quality for those who like a sprightly strawberry, having, besides sprightliness, a most distinctive flavor. A little too acid for dessert, canned or cooked, the berries are hardly surpassed in flavor. The calyx is large, leafy, and a beautiful green. A defect in the variety is that the apex colors slowly, so that the fruit must be picked carefully to avoid green tips. Plants of Good Luck must not be set closely, as they develop many runners. Good Luck originated with Elwood Pedrick, Cumberland County, Maryland, in 1904.

Perfect. Plants numerous, large, vigorous, healthy, very productive; leaves medium in size and thickness, with crenate margins; leaf-stalks long; flowers medium in season of bloom; fruit-stems long, thick, semi-erect, branching. Fruit late; large, retains size well to close of season, distinctly wedge-shape, with some cockscombs in the first picking; calyx large, attractive green, often surrounded at the base by small, fleshy protuberances; apex a pointed wedge, inclined to green tips unless picked with care; color attractive, medium red; flesh well colored to the center, juicy, firm, sprightly; good in quality; seeds both raised and sunken.

HAVERLAND. Fig. 303. For many years Haverland was considered one of the best strawberries for home use, and is still to be found in gardens in the northeastern states. The berries are too soft and too light in color for distant markets, but are often grown for near markets where the variety proves profitable because of the great productiveness of the plants. The crop ripens over a long season. The variety has the reputation of being very hardy, and its blossoms are said to be seldom injured by frost. Haverland originated in 1882 with B. H. Haverland, Cincinnati, Ohio.

303. Haverland. (×¾)

Imperfect. Plant large, upright, vigorous, healthy, very productive; leaves abundant, light green; runners few; fruit-stalks rather short, often too weak to hold up the fruit. Fruit midseason, medium to large, long-conic, sometimes necked, light scarlet; flesh light red, medium firm; core pink, solid; flavor mild subacid; quality good; seeds numerous, large, raised.

JESSIE. This old variety is little grown now in any part of the United States excepting near Sacramento, California, and even there is being discarded. It thrives in any rich soil and under high culture. The variety originated in Janesville, Wisconsin, with F. W. Loudon, in 1880.

Perfect. Plants vigorous, healthy, large, with many runners. Fruit midseason, large or very large, usually wedge-shaped, sometimes furrowed; color variable ranging from light to dark scarlet; flesh light pink, moderately firm, juicy and aromatic; quality good.

JOE. Fig. 304. *Big Joe. Joe Emerson. Joe Johnson.* This variety is a favorite in Maryland, New Jersey and Delaware, and is grown more or less in all parts of the United

304. Joe. (×¾)

States, except where the winters are particularly austere. Its outstanding merits are large, handsome, well-flavored berries, suitable for either home use or the markets. It is a desirable kind for intensive culture. Joe originated with Black, Son & Co., Hightstown, New Jersey.

Perfect. Plants few, vigorous, healthy, productive when planted close; leaves medium to very large, dark green; leaf-stems long, thick; fruit-stems long, thick, usually double, semi-erect; blooms late; calyx often large, leafy, usually flat. Fruit large to very large, midseason, blunt, round-conic or irregular wedge, surface furrowed, glossy dark scarlet; flesh dark red, firm, sprightly, good in quality; seeds numerous, raised.

JUCUNDA. This variety is one of the few sorts of European origin grown in America. It was formerly a standard in many parts of the United States, but is now grown only in the famous strawberry region of Steamboat Springs, Colorado, where it is liked because the plants are vigorous and healthy, and the stems hold the berries off the ground. The fruit is too soft to ship well and too light in color to look well. It was brought to America from England in 1859.

305. Kellogg Prize. (×¾)

Perfect. Plants vigorous, healthy, productive and make runners freely; fruit-stems stout, erect. Fruit late, large, round-conic to long-conic, light crimson; flesh white; mild subacid or sweetish, soft; quality very good.

KELLOGG PRIZE. Fig. 305. The plant-habits of this new variety seem to be exceptionally good, and the berries make a fine showing in size and color, and ship very well. It is worth trying as a late strawberry. The variety is a chance seedling found by R. M. Sears, La Grange, Illinois; it was introduced in 1913.

Imperfect. Plants medium or below in number, intermediate in vigor, healthy, productive; leaves of medium size and color, thick, dull, rugose; flowers early midseason; fruit-stems thick, prostrate, branching; calyx large, raised, leafy. Fruit matures late; above medium to large, blunt-conic to blunt-wedge, necked, medium to light red; apex slightly pointed; flesh light red throughout, juicy, firm, sprightly; quality fair to good; seeds raised.

KLONDIKE. Fig. 306. A general favorite in a large part of the United States, Klondike is grown almost exclusively in the south Atlantic and Gulf states for distant shipment. Its popularity is due to its healthy foliage

306. Klondike. (×¾)

and the firm flesh and deep red color of the berries, the last two characters fitting it for shipping and canning. The quality is not of the best, and the hulls do not part readily from the berries. Klondike originated with R. S. Cloud, Independence, Louisiana.

Perfect. Plants vigorous, healthy, productive; leaves large, dark green; leaf-stems long; fruit-stems long and thick, often single, erect; blooms in midseason; calyx large, reflexed, strongly tinged with dull red, flat or sunken. Fruit large, midseason, retains size as the season advances, blunt, round-conic, dark, dull, scarlet; flesh dark red, very firm, acid; rather poor in quality.

LA BON. This is a new variety remarkable for its long, dense root-system and large flattened fruits. The plants are about all that could be desired, but the berries are not very attractive in shape or color, and do not ship well. The variety originated with H. J. Schild, Ionia, Michigan, and was introduced in 1916.

Perfect. Plants numerous, vigorous, healthy, productive; leaves thick, very dark green, smooth, glossy; flowers early midseason; fruit-stems of medium length and thickness, semi-erect, branching, calyx intermediate in size, flat. Fruit medium early; large, irregularly furrowed, oblate to round-oblate, glossy, light red, colors unevenly; apex obtuse, indented; flesh light red, becoming whitish toward the center, medium in firmness, with hollow core, mild, not high-flavored; quality fair; seeds raised, prominent.

LADY CORNEILLE. The catalogs list this variety as a desirable kind in parts of the South. In the North, the plants are rather unproductive, and, while they are attractive and ship well, the berries are not of high quality. The variety originated with T. C. Corneille, Ponchatoula, Louisiana, in 1909.

Perfect. Plants numerous, vigorous, healthy, rather unproductive; leaves small, thin, medium smooth, glossy; flowers early; fruit-stems short, thick, semi-erect, branching; calyx large, raised, leafy. Fruit matures early; above medium in size, furrowed, wedge to blunt-conic, necked, often dark red; apex slightly pointed; flesh light red, becoming whitish toward the center, juicy, firm, sprightly, tart; quality fair; seeds raised.

LATE STEVENS. *Steven's Late Champion.* Late Stevens competes with Gandy in parts of New Jersey, Delaware, and New York, but as a rule is not so desirable a late variety. Faults are: the fruits lack uniformity in shape; the plants are not always productive; and the foliage is susceptible to mildew and leaf-spot. The variety originated with Arthur Stevens, Bridgeton, New Jersey, in 1897.

Perfect. Plants vigorous, susceptible to diseases, not always productive, make runners freely. Fruit late to very late, large, irregular wedge-shaped, crimson; flesh firm, light red, brisk subacid, aromatic; quality good.

LUPTON. Grown in southern New Jersey for the Philadelphia market, Lupton has to recommend it remarkably handsome fruits which ship well. The berries are so coarse and dry in flesh and so uninteresting in flavor, that the variety is one of the poorest in quality of all strawberries. The foliage is susceptible to leaf-spot. This is a comparatively new kind introduced by M. D. Lupton, Newport, New Jersey, in 1915.

Perfect. Plants large, vigorous, productive, susceptible to leaf-spot; make runners freely. Fruit midseason, very large, often double; color bright red, glossy, seldom turning dark after picking; flesh firm, dry, mild; quality poor.

McALPINE. This is a very late variety catalogued by several nurserymen as desirable. The plant-habits appear to be good, except in the matter of resistance to disease, but the berries are often green at the tips, and inferior in quality. Despite these faults the variety is worth trying. It originated with Hauseman Brothers, Hilton, New Jersey, in 1909.

Perfect. Plants numerous, vigorous, injured by leaf-spot, productive; leaves small, thin, light green, smooth; flowers early midseason; fruit-stems long, slender, erect, single; calyx of medium size. Fruit late; of large size, furrowed, blunt-wedge to blunt-conic, necked, dull, light red; apex indented, green-tipped; flesh light red, becoming whitish toward the center, very juicy, mild subacid; quality fair; seeds sunken.

MAGIC GEM. This variety, introduced in 1916, on the grounds of the New York Agricultural Experiment Station, is so like Brandywine as not to merit a separate description. It may be a slight improvement on the older variety in a few characters. It is a seedling of unknown parentage found by Edward Vance, Twin Falls, Idaho, in 1912.

MAGOON. This old variety is a favorite strawberry in parts of Oregon and Washington, because of the great productiveness of the plants and the high quality of the fruit. The berries are too soft for shipping. The plants need a deep, moist, rich soil. Magoon originated with W. J. Magoon, Portland, Oregon, about 1890.

Perfect. Plants large, making immense stools, healthy, very productive, making runners freely; fruit-stems long, slender, weak. Fruit midseason, medium to large, round-conic, irregular, dark crimson; flesh dark red, medium firm, mild subacid; quality good.

MARSHALL. *Henry.* Long a commercial variety of high standing in the northeastern states, Marshall fails south of Delaware and Pennsylvania. Wherever grown, the berries are a standard of excellence in quality. The plants require heavy, rich soils and intensive culture to force the foliage sufficiently to withstand leaf-spot. Under good conditions, the plants produce large crops of handsome, well-flavored berries. Marshall originated with M. F. Ewell, Marshfield Hills, Massachusetts.

Perfect. Plants medium in number, productive; leaves large, light to dark green; stout, usually double, prostrate; blooms in midseason; calyx of medium size, discolored, depressed. Fruit very large, midseason, round-conic, surface often irregularly furrowed, dark scarlet; flesh well colored, firm, juicy, pleasant acid, of high flavor; very good; seeds large, raised.

MASCOT. *Doris.* Mascot is grown in parts of New Jersey, Delaware, and Maryland, where it has merits as a late strawberry to take the place of Gandy. The vines are very productive, and the berries are large, handsomely colored, and of excellent quality. The variety is well worth testing where a very late berry is wanted. It is said to succeed where Gandy grows well. Mascot originated with T. M. Hanback, Warrenton, Virginia, about 1906.

Perfect. Plants numerous, productive; leaves rugose; flowers characteristically large and with crinkly petals, bloom late; fruit-stems long, thick, semi-erect, branching but little; calyx large, slightly raised. Fruit late, large, blunt-wedge or round, sometimes necked, dull, rather unattractive medium red; apex pointed, green-tipped, often somewhat seedy; flesh well colored to center, juicy, firm, sweet, mild, high flavored; very good in quality; seeds large, raised.

MICHEL. *Michel's Early. Osceola. Ella.* For many years Michel was a standard shipping sort for the South. It is still grown somewhat, but is being discarded. It originated with George Michel, Judsonia, Arkansas, in 1883.

Perfect. Plants vigorous, runners numerous, rather unproductive. Fruits early, rather small, round-conic, sometimes necked, dull scarlet; flesh light red, firm, acid; fair in quality.

MISSIONARY. This new variety is the leading commercial sort in central Florida, and is more or less grown in eastern North Carolina, the Norfolk region of Virginia, and in eastern Maryland. Earliness is its chief commercial asset, although the berries stand shipping well, and the plants are free from disease.

Missionary was sent out by E. W. Townsend & Co., Salisbury, Maryland, in 1906.

Perfect. Plants numerous, vigorous, healthy; leaves light green, smooth; season of bloom early; fruit-stems long, prostrate, branching, calyx small, raised. Fruit early; above medium in size, blunt-conic, often necked, very dark, dull red, colors evenly, apex somewhat pointed; flesh well colored to center, juicy, very firm, tart, not pleasant in flavor; fair in quality; seeds small, sunken.

MYER. This variety is grown only in southern Delaware, where it is prized for its productive plants, although the berries are large, attractive in quality, and ship fairly well. The flowers are imperfect, and are not so badly infested with the weevil as varieties with perfect flowers. It originated with Myer & Son, Bridgeville, Delaware, in 1906.

Imperfect. Plants intermediate in number and size, healthy, very productive; leaves medium in size, thin; flowers early; calyx large, leafy, depressed. Fruit midseason; above medium in size, regular, conic, scarlet, glossy and attractive, inclined to color unevenly; flesh light colored toward the center, medium in firmness, mild, sweet; quality good; seeds sunken.

NETTIE. The fruit of Nettie is late and very showy but not of highest quality. In plant and fruit the variety is somewhat like the well-known Gandy, but the crop ripens a little later, and is preferred in some sections to that of Gandy. Nettie originated in 1893 with Black, Son & Co., Hightstown, New Jersey.

Perfect. Plants rather numerous, vigorous, healthy, productive; leaves large, attractive, dark green; leaf-stems long, thick; fruit-stems long, thick, often single, erect; blooms late; calyx medium to large, leafy, attractive green, raised. Fruit late, very large to above medium, round-conic or wedge to elongated, rather dull, light scarlet; flesh of fair color, medium to firm, acid, not high in flavor; good in quality; seeds sunken.

NEW YORK. This is a favorite strawberry in the northeastern states in gardens and local markets, because of its large, sweet fruits, which are liked by many who cannot eat acid strawberries. Nurserymen offer several other varieties which are similar or identical with New York: as, Otto, Fairdale Giant, Morgan, Oswego, Pocahontas, Roosevelt, Ryckman, Maximus, Big Berry, Armstrong, Hummer, and Uncle Jim. It should be said that most of these varieties seem to have had independent origin. New York originated in 1890 with Martha Tanner, Slaterville Springs, New York.

Perfect. Plants large, vigorous, productive, with a moderate number of runners. Fruit midseason, large, wedge-conic, irregular, crimson; flesh red, soft to firm, mild subacid; quality good.

NICH OHMER. Nich Ohmer is grown rather freely in central Florida and the Watsonville region of California, and to some extent in other parts of eastern United States. The variety is considered desirable because of productive plants and very large, firm, attractive berries. The berries run small after the first picking, however, and are not always good in quality; but in spite of these faults the popularity of the variety is increasing. Nich Ohmer originated with J. F. Beaver, Dayton, Ohio, about 1895.

Perfect. Plants large, vigorous, productive, somewhat susceptible to leaf-spot, make runners freely. Fruit midseason, large, round-conic, dark crimson, glossy; flesh red, mild subacid, insipid in some localities and in others well flavored; quality ranging from poor to very good.

OREGON. Productiveness and large attractive berries of excellent quality make Oregon a valuable variety in the state for which it was named and in parts of California. It is grown for both home and market. Oregon originated with A. F. Hofstadtler, Salem, Oregon, about 1898.

Perfect. Plants numerous, of medium vigor, healthy, very productive; leaves small; flowers early; fruit-stem long, slender, erect, single; calyx of medium size, variable in position. Fruit early; of large size which is well retained throughout the season, very irregular in shape, averaging round-conic, glossy, medium to dark red, colors unevenly; apex blunt; flesh red throughout, juicy, firm, pleasantly sprightly; good in quality; seeds raised.

OZARK. *Early Ozark.* Earliness is the chief character making Ozark a popular commercial variety in Missouri and neighboring states. The product is especially valued for canning. The variety originated with Charles Shull, Sarcoxie, Missouri, in 1902.

Perfect. Plants numerous, medium in vigor, healthy, very productive; leaves small, medium green; leaf-stems slender, characteristically tinged red; flowers early; calyx small, reflexed, depressed. Fruit very early; above medium to medium in size, round-conic, glossy, dark scarlet; apex obtuse or indented; flesh well colored, very juicy, firm, subacid or pleasantly tart, high-flavored; quality very good to best; seeds small, sunken.

PAN AMERICAN. Fig. 307. Pan American is a claimant for recognition as the first of the everbearing strawberries, and as one of the parents of many later ones. The vines are not productive, make few plants, and the fruit is none too good, for which reasons the variety is being discarded. Pan American originated with Samuel Cooper, Delevan, New York, in 1898.

307. Pan American. (×¾)

Perfect. Plants vigorous, variable in productiveness; leaves small, dark green; leaf-stems short, slender; flower-stems short, stout, erect, double; calyx small, deeply set. Fruits of medium size, round-conic, obtuse, dull scarlet; flesh pale red, firm, aromatic, subacid; quality good; seeds very numerous, raised.

PARSONS. While nowhere highly prized, Parsons is grown somewhat in Delaware, Maryland, and western New York. The berries are liked by canners, as they retain their shape very well after cooking; have firm, red flesh; are excellent in flavor; and the hulls come

GOOD LUCK

off easily. The plants are very productive, but are somewhat susceptible to leaf-spot. The variety originated with R. G. Parsons, Parsonburg, Maryland, about 1895.

Perfect. Plants large, susceptible to leaf-spot, productive; numerous runners. Fruits midseason, medium to large, conic or wedge-conic, irregular, bright crimson; flesh red, brisk subacid, firm; quality fair to good.

PEERLESS. Of the several everbearing strawberries on probation, one of the most meritorious is Peerless, a recent introduction from Samuel Cooper, Delevan, New York. It is very similar in plant and fruit to the well-known Superb, but the berries are larger in size, of better quality, and the plants are more productive. The variety is adapted to conditions under which the older variety thrives. Under most conditions Peerless is a better strawberry than Superb and should replace it.

POCOMOKE. *Gibson.* This variety is occasionally found in western New York, but is more generally grown in Michigan and in the Middle West. Its outstanding characters are hardy and productive plants and large, handsome berries, firm enough to reach the market in good condition. Pocomoke resembles Parsons and by some is thought to be identical. The variety originated in Maryland and was introduced about 1902.

Perfect. Plants vigorous, healthy and make runners freely. Fruit midseason, medium to large, round-conic, bright crimson; flesh firm, well colored, brisk subacid; quality good.

PREMIER. This variety is being introduced by several nurserymen who speak well of it; at Geneva, New York, the berries run large and are attractive in shape. The variety is a seedling of unknown parentage raised by E. H. Riehl, Alton, Illinois, in 1912.

Perfect. Plants medium in number and vigor, healthy, productive; leaves small, rugose, dull; flowers early; fruit-stems very short, thick, prostrate, branching; calyx large, raised, attractive green. Fruit medium early; medium to small, long-conic to long-wedge, with furrow running from base to apex on the largest berries, necked, glossy, red; apex pointed; flesh red to the center, juicy, firm, with a firm core, sprightly; quality good; seeds sunken.

PROGRESSIVE. Of the score or more everbearing strawberries introduced in recent years, Progressive is the most widely known. Its outstanding characters are hardiness, freedom from disease, and handsome well-flavored fruits. The plants produce in the spring as well as the fall. The variety is adapted only to northern climates. Progressive originated with Harlow Rockhill, Conrad, Iowa, in 1908.

Perfect. Plants few, vigorous, productive, healthy; leaves dark green, smooth; season of bloom early; fruit-stems variable in length, thick, much branched; calyx flat, reflexed, attractive green and often with pink tinge. Fruit matures early; varies considerably in size ranging from large to small, blunt-wedge to blunt-conic, glossy, medium to dark red, colors evenly; apex obtuse; flesh well colored to center, firm, subacid, mild; good in quality; seeds prominent, raised.

PROLIFIC. Fig. 308. This variety originated on the grounds of the New York Agricultural Experiment Station and was distributed in 1908. Because of the vigor and productiveness of its plants, and the attractiveness of its large, handsome, well-flavored berries, the

308. Prolific. (×¾)

variety gives promise of taking high rank as a commercial sort. Unfortunately, the plants are somewhat susceptible to leaf-spot.

Perfect. Plants very numerous, vigorous, unusually productive, yielding on the Station grounds as high as 14,502 quarts per acre; foliage somewhat susceptible to leaf-blight in unfavorable seasons; leaf-stems long, thick; fruit-stems stout and usually single, semi-erect; blooms and ripens in midseason; calyx depressed. Fruit very large, retains size well as the season advances, round-conic to blunt wedge, attractive bright scarlet; flesh firm, good color, agreeably acid; quality good; seeds numerous, raised.

RICE. *Kitty Rice.* This is an old sort which now finds favor locally in Massachusetts. The berry is attractive in size, shape, and color, and is of highest quality. The plant-characters are below the average. The variety originated with J. F. Beaver, Dayton, Ohio, about 1890.

Imperfect. Plants of medium number, large, healthy, productive; leaves medium green; leaf-stems long, of average thickness; calyx large, flattened, reflexed, leafy. Fruit midseason; conic or inclined to wedge-shaped, scarlet, glossy and attractive; apex medium pointed; flesh light colored toward the center, very juicy, of medium firmness, high-flavored, tart unless fully ripe, when it becomes sweet; very good to best; seeds raised.

ROUGH RIDER. With but few characters of the plant to recommend it, Rough Rider is nevertheless a desirable late strawberry on account of the large size, bright color, and high quality of the fruit. The variety is grown only in New York and New England. It was introduced by L. J. Farmer, Pulaski, New York, in 1900.

Perfect. Plants vigorous, productive, making numerous runners; leaves of medium size, dark green; leaf-stems long, slender; fruit-stems slender, stout, double; calyx small, leafy, reflexed. Fruit late, large, retaining its size throughout the season, round-conic, dark scarlet; flesh firm, light red, well-flavored; good in quality; seeds depressed.

SAMPLE. Fig. 309. Once a standard sort, Sample is now passing from cultivation, al-

though it is still grown more or less in the northeast and middle western states It came into prominence because of the productiveness of the plants, and its large, uniform, hand-

309. Sample. (×¾)

some dark-red fruit. The berries are too soft for shipping long distances, therefore the variety is of value only for local market and home gardens. Dunlap is the best pollinator. Sample originated with J. D. Gowing, North Reading, Massachusetts, in 1894.

Imperfect. Plants large, healthy, productive and make runners freely. Fruits late, large, round-conic or long-conic, dark crimson; flesh dark red, firm, subacid, well flavored; quality good.

SHARPLESS. *Dawley. Ontario. Shaw.* Sharpless was one of the standard varieties in the last quarter of the century just passed, and is still grown on the Pacific coast from California to British Columbia The variety is noted for its very large berries, few other sorts producing so many of large size, although, unfortunately, many are malformed. Sharpless is rather capricious in bearing, tender in blossom, and many berries have green tips. The variety originated in 1872 with L. K. Sharpless, Catawissa, Pennsylvania.

310. Superb. (×¾)

Perfect. Plant medium in size, spreading; leaves medium in size; runners rather numerous; fruit-stalks long, stiff; calyx medium, easily detached. Fruit midseason to late, large, often irregular, wedge-conic, bright scarlet; flesh light red, firm; core pink, hard, sometimes hollow; flavor mild subacid; quality good; seeds raised.

SUPERB. Fig. 310. After Progressive, Superb is probably the most generally grown of the everbearing strawberries. It has to recommend it hardy and healthy plants and handsome, richly-flavored berries. It needs an abundant supply of moisture, hence is well adapted to the irrigated regions of the Northwest, although it is grown in the Northeast as well. It originated in New York about 1908.

Perfect. Plants large, productive, healthy, make runners freely. Fruit midseason, large, round or round-conic, dark crimson when fully ripe; flesh light crimson, soft to firm, mild subacid; quality good except late in the season in cool weather.

SUPERIOR. This variety is a favorite in some parts of Delaware and New Jersey, being prized for its productive plants and attractive, highly-flavored fruits. The berries average small for the season, which is against it as a commercial fruit. Superior originated with E. W. Townsend & Co., Salisbury, Maryland, about 1888.

Perfect. Plants numerous, vigorous, productive; leaves large, thick, medium green; leaf-stems long, slender; flowers very early; calyx average size, flattened, leafy, Fruit midseason, large, conic or wedge-shaped, glossy, bright scarlet; apex variable in shape; flesh well colored, juicy, firm aromatic, high-flavored, subacid or sweet; very good in quality; seeds raised.

TENNESSEE. This variety is a favorite in the District of Columbia, having been discarded in most other regions. About Washington, it is liked because of the productiveness of the plants and the attractiveness of the berries. The fruits are too soft for distant shipment. The variety originated in Tennessee and was introduced about 1892.

Perfect. Plants healthy, vigorous, productive, and make runners freely. Fruit early, medium to large, round-conic to wedge-shaped, bright crimson; flesh red, soft or rather firm, subacid; pleasantly flavored; quality good.

THOMPSON. *Lady Thompson.* At one time largely grown in the southeastern states, Thompson is now nearly supplanted by Klondike. The plants are very productive, but the berries are too soft and too light in color for a good commercial sort. The variety does especially well on poor soils. It originated with D. A. Thompson, Mount Olive, North Carolina, in 1894.

Perfect. Plants large, vigorous, fairly healthy and make runners freely. Fruits of medium size, round-conic or conic, bright scarlet; flesh light red, subacid, rather soft; quality good.

TRIOMPHE. *Triomphe de Gand.* Introduced more than a half-century ago, Triomphe is still grown in some parts of the East, and is said to be much valued for intensive culture in the Pacific states. It is one of the few exotic sorts that have proved profitable in North America. The variety originated in Belgium, and was introduced by Ellwanger & Barry, Rochester, New York, in 1855.

Perfect. Plants large, healthy, productive; runners few or moderate in number. Fruits late, large, round, sometimes cockscombed, bright crimson; flesh white, firm, mild subacid; quality very good.

UNCLE JIM. *Dornan.* Despite unattractive color of berries, which, besides, are often too coarse to be inviting, this variety is

rather commonly grown in some parts of Michigan. It originated with J. F. Dornan, Glenn, Michigan, in 1898.

Perfect. Plants of medium number, vigorous, healthy, productive; leaves very large, dark green; leaf-stems long, slender; fruit-stems long, thick, double, prostrate, blooms midseason; calyx large, sometimes leafy, often discolored, variable in position. Fruit large to medium, retains size well in late pickings, wedge-shaped or round-conic, surface furrowed, dull, unattractive light and dark scarlet; flesh medium red, firm, mild; quality fair to good; seeds sunken.

WARFIELD. Fig. 311. For many years a standard sort, Warfield is now quite generally discarded except in the northern part of the Middle West, where it is still grown, being prized for its hardy, healthy, and productive plants. The fruits are especially well liked by canners, as they retain their color, shape, and flavor very well. The berries run small, unless the plants are grown on rich soils and given high culture. Dunlap is the best variety to pollinate it. The variety originated in Illinois in 1882.

311. Warfield. (×¾)

Imperfect. Plants large, vigorous, healthy, productive and make runners very freely. Fruit early to midseason, medium in size, round or round-conic, dark crimson, glossy; flesh soft or fairly firm, dark red, acid, well flavored; quality very good.

312. William Belt. (×¾)

WILLIAM BELT. Fig. 312. *Belt.* William Belt has long been a favorite in New England and New York for the home-garden, for which it is well fitted because of the productiveness of its vines and its handsome dark-red, well-flavored fruits. The berries are not firm enough for the market. It should be planted in fertile soils and receive the best culture. The variety originated with William Belt, Mechanicsburg, Ohio, about 1888.

Perfect. Plants vigorous, fairly healthy; runners numerous. Fruits medium to late, large, irregular, globose-conic or wedge-shaped; flesh rather soft, outer color dark crimson with dark red flesh; core pink, hollow; mild subacid; quality very good to best; seeds prominent.

WILLIAMS. This variety is grown in the Niagara district of Canada and the United States. Its virtues are productive vines and handsome dark-red fruits; its faults, susceptibility to diseases and too many berries with white tips. The variety originated on the Carlton Fruit Farm, St. Catherines, Ontario, about 1890.

Perfect. Plants few, of medium vigor, healthy, productive; leaves medium in size, dark green; leaf-stems of fair length, slender; fruit-stems short, variable in thickness, often double, prostrate; blooms late; calyx of medium size, not leafy, pale green, flat. Fruit large to medium, late, blunt, round-conic, dark scarlet, dull; flesh dark red, firm, agreeably acid, pleasant flavor; quality good to very good; seeds raised.

WILSON. No other strawberry now offered by nurserymen has been so long under cultivation as Wilson, and no other one has been so commonly grown. For many years it was grown in all parts of the United States, but it is now planted only about Rochester, New York, and in the states of Oregon and Washington. In these regions it is liked for its productive plants, and its dark-red, acid fruits, for which the canners are willing to pay a high price. It succeeds only on the most fertile soils. Wilson originated with James Wilson, Albany, New York, in 1851.

Perfect. Plants large, healthy, vigorous, productive, make runners freely; fruit-stems of medium length, erect, branched. Fruit early midseason, of medium size, round-conic, dark crimson; flesh dark red, very firm; core solid, acid; quality very good; seeds even with the surface but rather prominent.

WOOLVERTON. This variety is somewhat grown in Delaware to pollinate Meyer, which it so closely resembles that the two can be shipped together. It originated in Canada and was introduced about 1891.

Perfect. Plants of medium size, rather productive, healthy, make runners freely. Fruit midseason, large, round-conic to wedge shape, crimson; flesh red, rather firm, mild subacid; quality good.

PART VIII

MISCELLANEOUS FRUITS

CHAPTER XXVI

PERSIMMONS, MULBERRIES, PAPAWS, ELDERS, HIGH-BUSH, CRANBERRIES, BUFFALO-BERRIES, GOUMIS, AND BARBERRIES

Besides the commonly cultivated plants, there are a great number of tree- and bush-fruits in North America which yield edible products. The aborigines in what is now the United States obtained food from about 200 species of tree, bush, vine and small-fruits. Not more than 45 of these are under cultivation, and unquestionably more of them will be domesticated to the enrichment of American pomology. Indeed, something is being done now towards the domestication of the most promising. Possibly the persimmon is the most important of these: a number of varieties of this fruit already have been introduced to cultivation.

THE PERSIMMON

The persimmons are members of the genus Diospyros, in which there are more than 150 species, mostly inhabitants of the tropics in both hemispheres, but a few grow in temperate climates and fall under the head of hardy fruits. Diospyros belongs to the ebony family (Ebenaceæ), of which the ebony of commerce is the type. Two species grow in temperate eastern North America, one of which is already of importance in pomology and the other gives some promise of value. Besides these native persimmons, a score or more varieties of Asiatic persimmons have been introduced under the names Japanese persimmon or kaki. These foreign fruits are tender to cold, being but little hardier than the orange, and thrive only in California and the cotton-belt of the South, therefore can hardly be considered as proper subjects for discussion in a book on hardy fruits.

Of the two native persimmons, the black persimmon, *Diospyros texana,* abounding in western and southern Texas, while of some promise, is not yet planted for its fruit, and may therefore be dismissed without further discussion. The American persimmon, *Diospyros virginiana,* the wild persimmon of southeastern America, since the discovery of the country has attracted the attention of explorers and colonists; its fruit has been utilized from the first settlement of the country; and it is the plant of present importance, with prospective value equal to that of almost any other native fruit.

Diospyros virginiana, Linn. American Persimmon. Common Persimmon. Simmon-tree. Date Plum. Possum-wood. Tree 50-100 feet, round-topped head, branches spreading or drooping, irregular; bark thick, hardy, brown or black, fissured into small blocks. Leaves ovate or oval, pointed, 3-6 inches long, hairy when young, smooth with age or pubescent beneath. Flowers yellowish-green, diœcious, the sterile on one tree, the fertile ones on another, the former in small clusters, the latter solitary; corolla usually 4-lobed; sterile flowers ⅓ inch long with 16 stamens; fertile with a pointed hairy ovary surmounted with 4 slender styles, ½ inch long. Fruit a drupe, reddish-yellow or sometimes purplish, globose or obovate, set in a leathery 4-lobed calyx, 1½ inches in diameter, pulpy, astringent when green, sweet when ripe or after frost; variable in size, color and flavor.

The persimmon is usually found in woods, preferring dry lands, from Rhode Island, southern New York, Iowa, and Kansas southward to Florida and Texas. As wild plants, the trees are little attacked by insects and fungi; thrive under exceedingly variable conditions; vary greatly in tree and fruit; are vigorous, self-assertive plants and promise rapid and easy domestication and improvement.

The early explorers found the persimmon used by the Indians, and, while at first they found that "Persimmons were harsh and choakie and furred in a man's mouth like allam," they pronounced the fruit pleasant and luscious when they discovered that it was edible only when dead ripe or touched by frost. DeSoto seems to have been the first European to discover the persimmon, having found the fruit helpful in eking out the scanty fare for his men in the autumn of 1539. The description of it published in the narrative of DeSoto's expedition in 1557 was the first, but in the next century persimmons were admirably described by several explorers.

The persimmon is usually thought of as a fruit of the cotton-belt, because it grows most abundantly in the far South, and bears fruits much less austere southward. Nevertheless, wild persimmons grow as far north as the Great Lakes, and planted trees grew for many years on the grounds of the New York Agricultural Experiment Station, central New York, succumbing to the cold winter of 1916-17. Most of the varieties now under cultivation have come from southern and southwestern wild plants. Selections made from the most northern trees would probably result in hardier varieties, although the quality might fall short. The chief difficulties in growing persimmons at present are found in propagation and transplanting. Named varieties must be budded or grafted—difficult operations,—and the tree, having a long tap-root, is not easily transplanted.

The fruits of the persimmon vary in size from that of a small cherry to that of a large plum. They are sometimes entirely destitute of seeds, these seedless sorts being pleasantest to eat, although they more often run small in size. The fruit of some trees is soft, crushing as easily as a ripe peach, while on other trees it remains as hard as a green apple even after heavy frost. The produce of some trees is sweet and luscious at maturity without the action of frost, while on others it is astringent and inedible to the end, neither maturity nor frost alleviating its austerity. The persimmon ripens its fruit in midsummer near the Gulf, but not until late autumn at its northern limits, where the trees retain the crop until after heavy frosts. The fruits vary in color from yellow to orange and even purplish red, with many varietal marks, and are often covered with more or less bloom. The crop of late varieties often turns dark red, shriveling and drying on the trees until the fruits resemble dried dates in appearance and somewhat in taste. The best varieties are those that ripen as the leaves begin to fall, the earliest and latest fruits being poor in flavor.

There seem to be few records of successful efforts at crossing native persimmons with Japanese varieties, yet such crosses have been made. The Japanese persimmon, or kaki, has been cultivated for centuries in Japan and China, and hundreds of varieties have been developed. One species at least, probably *Diospyros Kaki,* is hardy as far north as Pekin and is found in the colder parts of Japan, regions as cold as New England; there are no reasons why strains of this species could not be grown wherever the peach can be grown in North America. Since hybridization is possible, there are great opportunities in the crossing of Japanese and native persimmons for both northern and southern fruit regions in America. This would give the country a handsome new fruit of excellent quality, easily grown, which stands shipment when fresh, and can be kept long when dried.

Some twenty or thirty nurserymen in the South and California offer varieties of persimmons for sale. The best varieties are described by W. F. Fletcher in *Farmer's Bulletin* No. 685, United States Department of Agriculture, from which the following descriptions, with two exceptions, are taken:

DESCRIPTIONS OF VARIETIES OF PERSIMMONS

BOONE

Daniel Boone

Origin, Indiana, where it ripens during October and November; form, roundish oblate; size, medium; color, yellow with dull blush in the sun; skin, rather tough; seeds, numerous, flavor, sweet but not rich; quality, good.

BURRIER

Origin, central Kentucky, where it ripens rather early; form, oblate; size, medium; color, yellow; practically seedless; flesh, soft; quality, very good.

DELMAS

Origin, Scranton, Mississippi, where it ripens during October and early November; form, roundish-oblate; size, medium to large; color, reddish-yellow; skin, thin, and tough; seeds, numerous; flavor, sweet and rich; quality, very good.

EARLY BEARING

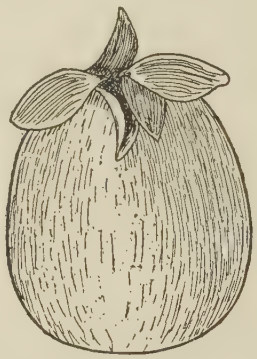
Introduced from Cartersburg, Indiana, where it ripens early in October; form, round-ovate; size, medium; color, dull yellow; quality, good.

EARLY GOLDEN

Origin, Illinois, where it ripens in September; form, oblong; size, medium to large; color, yellow; skin, thin; seeds, few; flavor, sweet; quality, very good.

GLIDWELL

This variety is offered in Indiana as one of the best native persimmons for that region, it having originated a few years ago in that state. The fruit is described as large, oblong, good in quality and as without astringency.



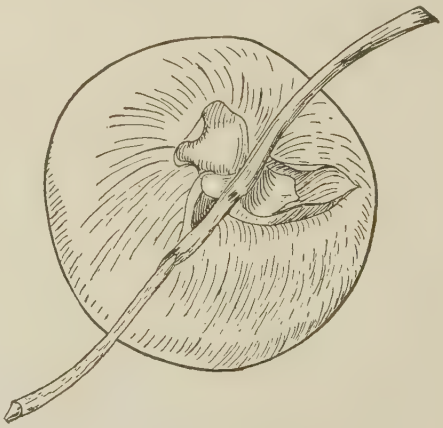
313. Golden Gem Persimmon. (×1)

GOLDEN GEM. Fig. 313

Introduced from Borden, Indiana, where it ripens from August to October; form, roundish-oblong; size, medium to large; color, dark orange to red; seeds, few; flavor, rich and sweet; quality, good.

HICKS

Origin, Washington County, Indiana, where it ripens in October; form, roundish-oblate; size, medium to large; color, dark red; skin, thin and tender; seeds, few; flavor, rich; quality, very good.



314. Josephine Persimmon. (×1)

JOSEPHINE. Fig. 314

American Honey. Honey

Origin near Bluffton, Missouri, where it ripens in September; form, roundish-oblate; size, medium; color,

bright yellow, changing to pale translucent; skin, tough; seeds, few; flavor, sweet and rich; quality, good.

KANSAS

Introduced from Missouri, where it ripens in September; form, roundish-oblate; size, rather large; color, yellow splashed with red; flavor, rich; quality, very good.

KAWAKAMI

This is a hybrid between the American and the Japanese persimmon, having the size and shape of the Japanese variety and the flavor of the American. It is said to be almost as hardy as the native persimmon. Nurserymen in Texas have been offering it since 1905.

315. Miller Persimmon. (×1)

MILLER. Fig. 315

Origin, Jackson County, Missouri, where it ripens in September; form, roundish-oblate; size, large; color, reddish-yellow, translucent; skin, tough; seeds, rather numerous; flavor, sweet; quality, good.

316. Ruby Persimmon. (×1)

RUBY. Fig. 316.

Little's Ruby

Introduced from Cartersburg, Indiana, where it ripens during September and for some time later; form, roundish-oblate; size, small to medium; color, yellowish-red, shading to deep red; skin, tender; seeds, few; flavor, sweet; quality, very good.

SHOTO KOTO

Introduced from Danville, Indiana, where it ripens during October; form, oblong-ovate; size, large; color, dull yellow, blushed in the sun; skin, rather tough; seeds, few; quality, very good.

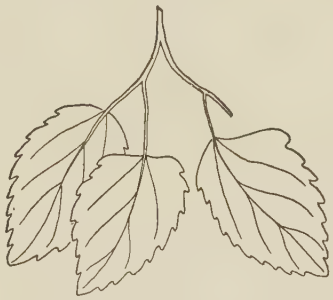
SMEECH

Introduced from Pennsylvania, where it ripens during October and November; form, roundish-oblate; size, medium; color, dull yellow, splashed with red; flavor, rich and sweet; quality, very good.

THE MULBERRY

The genus Morus, to which the mulberry belongs, is a small one, not more than ten species now being recognized. All of these produce edible fruits, but only three are cultivated for their fruits. Morus is a member of the mulberry family (Moraceæ), and is associated with the fig, the bread-fruit of the tropics, and several genera producing the rubber of commerce. Two of the ten species of Morus are natives of North America, all of the others being inhabitants of temperate regions in Europe and Asia, most abundant in the last-named continent. All are well known for their edible, berry-like fruits, and as trees upon which the silkworm feeds.

The species cultivated for their fruits are all trees with milky sap and fleshy yellow roots. The leaves are alternate, deeply lobed, and deciduous. The flowers are dicœcious or moncœcious, both sexes in small, hanging, cylindric axillary catkins, the staminate ones soon falling. The fruit consists of an aggregation of more or less united and compressed drupelets tipped with the remnants of the stigma and enclosing a nutlet, the multiple fruit resembling a blackberry.



317. White Mulberry. (×½)

1. *Morus alba,* Linn. Fig. 317. White Mulberry. Tree 30-60 feet, low-branched, with bark broadly furrowed into light-brown ridges. Leaves thin, firm, rather small, ovate or ovate-oval, taper-pointed, rounded or heart-shaped at the base, variously lobed, doubly toothed, the teeth large, obtuse, smooth and light glossy green above, paler along the paler veins beneath. Staminate flowers in slender catkins, ½-1 inch long; pistillate catkins shorter and thicker. Fruit variable, usually oblong-oval, white or pinkish, sometimes nearly dry, sweet and often insipid.

The home of *M. alba* is supposed to be northern China and Japan. This species in its many forms has been cultivated in China and Japan from the remotest times to furnish food for the silkworm. Long before the Christian era, it spread westward through India and southern Asia, but did not reach Europe until the Middle Ages, where its cultivation for silkworms soon became general in Italy and France. It is one of the most interesting and important tree-plants under domestication. No other tree gives employment, directly and indirectly, to so many people. Few trees, if any, supply a product of greater value. No

other tree has been so much discussed in literature. Cultivation for centuries in widely different soils and climates and for special characters has produced many strains of the white mulberry, some of which have been raised to the rank of species.

Most important of these outlying forms of the white mulberry is *M. multicaulis,* Perr, from China, where it is the chief silkworm mulberry. This tree was introduced into the United States in 1826 as food for silkworms; the silk industry was started earlier by private individuals and then fostered by state and national legislation. Its introduction brought on the "Multicaulis Craze," the most dramatic and the most disastrous agricultural episode North America has known. (For a full account of the "Multicaulis Craze" and of mulberries in general, see Bailey's *Evolution of our Native Fruits,* Chapter II.) But of the millions of trees of the Multicaulis mulberries then planted, scarcely a plant now remains in the North, the trees having proved tender to cold, and but few are to be found in the South.

According to Bailey, but one variety of the Multicaulis mulberry was introduced for its fruit,—the Downing, from seeds sown by Charles Downing, Newburgh, New York, about 1846. While popular at first, the Downing proved to be but half-hardy and soon disappeared in the North. It is still grown somewhat in the South for its fruits and as a stock upon which to graft other mulberries. Nurserymen in the North offer a Downing mulberry, but this is not the original variety, Bailey tells us, but a supplanter belonging to *M. alba.* By whom and when the transfer was made does not appear.

The variety now sold as Downing, according to Bailey, is the New American introduced about 1854 by N. H. Lindley, Bridgeport, Connecticut, probably a seedling of one of the mulberries introduced in the attempt to start the silk industry. Trowbridge and Thorburn are very similar, both of them varieties of a generation ago, but not now found in the trade catalogs. All three are forms of *M. alba.* Besides these horticultural varieties of *M. alba,* we have in America a botanical variety of this species, var. *tatarica,* Loud., the Russian mulberry, a hardy type introduced in America by the Russian Mennonites in 1875-77, of which Bailey records two varieties, Ramsey White and Victoria. The varieties of the white mulberry are all unimportant and little known; nor is there much promise in the species as a fruit-producing plant, the fruits being too sweet, insipid, and dry as compared with those of other species. European writers, however, state that the white mulberry is one of the mainstays of existence in Turkestan and neighboring countries, where the product is said to be used fresh, dried, dried and ground into meal, for fattening hogs, and for poultry. Possibly, however, these varieties of Turkestan are forms of *M. nigra,* next to be discussed.

2. *Morus nigra,* Linn. Fig. 318. Black Mulberry. Tree taller and stouter than that of *M. alba;* branches numerous, slender, spreading, forming a large round head; bark slightly fissured, with many dark scales. Leaves thin, firm, short, taper-pointed, rounded or heart-shaped at the base, sharply toothed, usually not lobed, dark green and rough above, paler with prominent veins beneath. Flowers very similar to those of *M. alba.* Fruit comparatively large, oblong, black when fully ripe, with dark red juice.

318. Black Mulberry. (×½)

The black mulberry is supposed to have come from Persia and adjacent countries, but has long been known in Europe, and is now naturalized in the milder climates of that continent. The species is rather widely cultivated in the Old World for its fruits, and there are several named varieties. It was early introduced in America, and has escaped from cultivation in many parts of the South and California. North of the Potomac, it can be grown only in sheltered situations, as it is scarcely so hardy as the peach. The fruit is larger and juicier than that of the other mulberries and not so sweet and insipid. The tree is well worth cultivating as a fruit-plant, and has been singularly neglected in the regions in which it thrives, but one variety, the Black Persian, being listed in the fruit-books. All who know the fruit of this species in Europe and Asia speak of it as most wholesome and palatable as a dessert fruit, for culinary purposes, and for the making of cooling beverages. This and the other mulberries, so far, have few insect and fungus troubles in America, but the birds take enormous toll, and might make profitable cultivation difficult.

3. *Morus rubra,* Linn. Fig. 319. Red Mulberry. Native Mulberry. Virginia Mulberry. Tree attaining a height of 40-80 feet, and a diameter of 3-5 feet, being the largest of the mulberries; trunk stout and short; branches stout, spreading, comparatively few, forming a round-headed top; bark fissured into long plates, dark reddish-brown. Leaves thin or membranous, large, various in shape, singly or doubly toothed, those on

young shoots deeply lobed, the upper surface rough, yellowish-green, the lower surface more or less pubescent, with yellowish veins. Staminate flowers in much larger catkins than in other species, 2 inches in length; pistillate catkins half as long. Fruit 1-1½ inches long, cylindric, bright red, becoming nearly black, variable in size and color, sweet or pleasantly piquant, sometimes very good; season July to September in central New York.

The red mulberry is a rather widely scattered plant from western New England and Long Island through Canada to the Black Hills in North Dakota, and southward to Florida and southern Texas. It prefers deep, rich, well-watered soils, and is usually found in the bottomlands of streams, where the trees attain a size of first magnitude as forest plants. Nurserymen in the North find that the young trees are tender to cold, becoming hardier with age.

319. Red Mulberry. (×½)

The fruit is often rated by botanists as valuable only for poultry and swine, and doubtless it is not held in high esteem in this country, where other fruits are abundant; nevertheless, there are already several well-known varieties which yield a product quite equal in size and quality to that of the best varieties of the black mulberry, a fruit much prized in the Old World. The red mulberry is well worthy of a place on large grounds as an ornamental. It is planted occasionally near fruit plantations with the hope of keeping the pestiferous robin from destroying more valuable fruits—usually a vain hope.

Two other American mulberries are worthy of brief mention. Var. *tomentosa* is a pubescent-leaved type which has given rise to a horticultural variety in Texas, the Lampasas. The Mexican mulberry, *R. celtidifolia,* H.B.K., with its habitat from north Texas, New Mexico, and Arizona through Mexico and Central America to Peru, is sometimes planted in the territory in which it grows wild as a fruit-tree. It is, however, according to the botanists who have described it, inferior to either the red or the black mulberry.

VARIETIES OF MULBERRIES

American fruit-books describe thirteen varieties of mulberries, of which brief descriptions are given herewith. The descriptions are all compiled, the data being so scant and fragmentary that the compilations are far from satisfactory. Seedlings under cultivation and wild plants, from seeds distributed by birds, are found in regions where the mulberries thrive.

BLACK MULBERRY OF SPAIN. *M. nigra. Noir of Spain.* Under the two names given, this mulberry is offered by nurserymen in the Pacific states. It is described in the catalogs as an everbearing mulberry of large size, the berry resembling the Lawton blackberry in shape and appearance. The fruits are black, with the piquancy of blackberries rather than the insipid sweetness of most mulberries. The tree is vigorous, a profuse bearer, hardy in the far West, and with drooping, almost weeping, branches. In California and Oregon it is considered the best of the mulberries for its fruit. The variety was probably introduced from the Old World by Felix Gillet, Nevada City, California, thirty or more years ago.

DOWNING. Fig. 320. *M. multicaulis. Downing's Everbearing.* This variety is supposed to be the sole representative of *M. multicaulis,* trees of which numbered a million or more in the United States less than a century ago. Downing is now little known; the variety offered by nurserymen under this name is usually New American. The true Downing is tender to cold, and, if now to be found at all, must be looked for in the South. It originated with Charles Downing, Newburgh, New York, about 1846. The fruit is but briefly characterized in the old catalogs as "large, black, subacid, very good." It was of this variety that Henry Ward Beecher wrote: "I regard it as an indispensable addition to every fruit-garden; and I speak what I think when I say that I had rather have one tree of Downing's Everbearing Mulberries than a bed of strawberries."

320. Downing Mulberry. (×½)

HICKS. *M. rubra. Hicks Everbearing.* Although one of the oldest named mulberries, Hicks is still offered by nurserymen as one of the best. It seems to have been grown in the South since 1850, and probably originated in Georgia some years before that date. The tree is described as very vigorous and a most abundant bearer. The fruit is medium to large, very sweet and somewhat insipid. While grown for human consumption, the produce is valued in the South, where, only, the variety is largely planted, for fattening swine and for poultry. Its season extends over three or four months.

JOHNSON. *M. rubra.* It is doubtful whether Johnson can now be purchased from nurserymen, although no doubt old trees of it can be found in many parts of the South. It is described by Downing in 1872 as follows: "A seedling from Ohio. Fruit very large, oblong-cylindric; blackish color, subacid, and of a mild agreeable flavor. Growth of the wood strong and irregular. Leaves uncommonly large." The fruit seems to have been about the largest produced by any named mulberry, but was borne sparingly. The variety

originated in Ohio at some time previous to 1845.

LAMPASAS. *M. alba tomentosa.* Lampasas may be dismissed with the statement that it is now listed by but one nurseryman in Texas, who condemns it with faint praise. The tree is described as of a spreading shrub-like growth. The fruit is reported to be of fair size and of very good quality. The variety seems to be passing out because of tenderness to cold, winter-killing in Texas, only 200 miles from its place of origin. Lampasas was found wild in the county of the same name in Texas, and was introduced by T. V. Munson, Denison, Texas, about 1889.

MERRITT. *M. alba.* In Florida, where mulberries are grown chiefly for swine and poultry, Merritt is recommended as the earliest variety, its crop beginning to ripen in April and continuing for eight to ten weeks. The tree is described as very vigorous, productive, and as coming in bearing at an early age. The fruits are large and of good flavor. The variety has been listed by a few nurserymen in the southeastern United States for a few years, but where and when it originated, it is now impossible to ascertain.

MUNSON. *M. alba.* One of the newest mulberries is Munson, which originated with T. V. Munson, Denison, Texas, about 1900, presumably from *M. alba.* It is described as follows: "One of the largest, most prolific, and best mulberries of the Russian class. The branches and fruit look like ropes of big berries. It is earlier than Hicks."

NEW AMERICAN. Fig. 321. *M. alba.* This is the best if not the only variety grown for its fruit in the North, often being offered as Downing. The trees are strong, vigorous, and very productive. The fruits are large, one to two inches long, black, glossy, sweet but not insipid; they begin ripening in July in central New York and continue through September. Bailey says it is undoubtedly a chance seedling of one of the old silkworm mulberries, *M. alba.* Two other varieties, Trowbridge and Thorburn, are mentioned as almost indistinguishable from New American; these are no longer found in nurserymen's catalogs. New American was brought to notice about 1854 by N. H. Lindley, Bridgeport, Connecticut.

321. New American Mulberry. (×½)

PERSIAN. *M. nigra.* Without further description than to say it is one of the best of the European mulberries, Persian is offered by several nurserymen in the Pacific states. Probably the Black Persian catalogued by nurserymen in the South some years ago was the same. The tree is described as vigorous and productive, but slow of growth. The fruits are black, one and one-fourth inches long, aromatic, with subacid flavor. It has been mentioned in American fruit literature for at least fifty years.

RUSSIAN. *M. alba.* Nearly all dealers in trees offer the Russian mulberry as a fruit-plant, but it is doubtful whether the common type is of value for its fruit for any other purpose than feeding swine and poultry. The tree is spreading, drooping, hardy, very productive, and ripens its crop over a long season. The fruit is of medium size, purplish-black to creamy-white, insipid. At least two named sorts, both from Texas, have been offered, Ramsey White and Victoria. As late as 1910 both were found in catalogs, but both seem now to have been discarded. Old trees might be looked for in Texas and neighboring states.

STUBBS. *M. rubra.* The red mulberry has still another variety in Stubbs, a comparative newcomer, which, as yet, is offered by only a few nurserymen in the South. The tree is described as very vigorous and the most productive of all mulberries. The berries are very large, nearly two inches long and more than a half-inch thick, deep black, with a rich, subacid, vinous flavor. The original tree was found in Laurens County, Georgia, by John M. Stubbs, about 1875.

TOWNSEND. *M. rubra.* This is a comparatively new variety, much esteemed in the South for extreme earliness, ripening its fruit in March and April. No doubt it is an offspring of *M. rubra.* The tree is large, vigorous, and very productive. The fruits are of but medium size and flavor; the introducer recommends it especially as a fruit to toll birds from other fruits. The variety was found at Glen Saint Mary, Florida, about 1900, and was soon after introduced by Glen Saint Mary Nurseries.

TRAVIS. *M. rubra.* This is a comparatively new variety from Travis County, Texas, which is recommended highly for its native state. Presumably, it is an offspring of *M. rubra.* The tree is described as very large, vigorous, luxuriant in foliage, compact, and as bearing over a long season very profusely. The fruit is rated as the best of all mulberries for human food—very large and sweet. The variety was introduced about 1900 by the Austin Nursery, Austin, Texas.

PAPAW

The papaw, *Asimina triloba,* Dun., is a member of the custard-apple family (Annonaceæ), widely distributed in the tropics, but having few representatives in the temperate zones. From this family come a large number of tropical fruits useful in medicine, as spices, and as dessert fruits; among the last are the

soursop, sweetsop, and the custard-apple, all luscious dessert fruits in tropical countries. The generic name of the papaw, Asimina, is said to come from *assiminier,* an Indian appellation. The common name comes from the fancied resemblance of the fruit to that of the tropical papaw, *Carica Papaya,* an unfortunate christening, for there is little similarity between the two, and the plants belong to widely different families. Besides the hardy species here considered, there is a subtropical shrubby papaw, *A. grandiflora,* growing in Florida, which is said to produce very delicious fruit. The chief botanical characters of the papaw are as follows:

Asimina triloba, Dun. Plant a small tree or tall shrub attaining a height of 30-40 feet, with smooth, brownish bark, blotched with gray-brown. Leaves alternate, deciduous, entire, obovate-lanceolate, 8-12 inches long, sharply pointed, with a wedge-shaped base, smooth or nearly so. Flowers axillary, solitary or few, short-stalked, nearly 2 inches across; sepals 3, smaller than the petals, deciduous; petals 6, in 2 series, the 3 outer ones larger, at first green, becoming purple; stamens numerous, with short filaments; pistils several, borne on the top of a globose receptacle. Fruit a large berry, 3-5 inches long, half as thick, oblong-cylindric, yellow or white when ripe in the autumn; seeds 1 inch long, ½ inch broad, ovate, imbedded in the pulp.

The papaw is an inhabitant of eastern America, from New Jersey westward through southwestern New York, southern Ontario, and southern Michigan to Kansas, and southward to Texas and Florida. It is rare in the East, but very common in the Mississippi Valley, often forming dense thickets on rich river-bottom lands. In the wild, the plants are very conspicuous for their large leaves and handsome flowers and fruits.

The papaw seems to have been an important food resource with the aborigines, but the early settlers were of two minds in regard to it. Some praised it extravagantly; others condemned it as a product to be eaten only in case of dire necessity. All agree that it is a nutritive food. The leaves when bruised have a rank odor, and the aromatic odor of the fruit is disagreeable to many. The pulp, which resembles custard somewhat in color and consistency, in well-ripened fruits is very rich, and, until a taste is acquired for it, quite too rich for the palates of most persons. The large seeds make the papaw unpleasant to eat as a dessert fruit. Nevertheless, the papaw is found as a market fruit in towns and cities about which it grows abundantly, and seems to be prized by those who have long known it. At one time, nurserymen offered one or two named varieties for their fruits and as ornamentals, but these seem to have disappeared. As long as the wild supply continues abundant, it is doubtful whether great interest can be awakened in the domestication of the papaw.

A fully grown papaw is green with a heavy bloom. The flesh is greenish-white, being almost white at the center, and at this time has a most offensive, fetid odor and taste. As the fruit matures, the skin becomes brownish-black, the flesh changes to yellow or creamy white, the hard flesh becomes soft, succulent, rich, sweet, and to some tastes delicious. The seeds in ripened fruits separate easily from the soft pulp. The delicacy of flavor is heightened by light frosts. A ripened papaw is too soft for distant shipment. There seem to be two natural varieties of papaw. In one, the flesh of the fruit is creamy white; in the other, yellow. There are no differences in the trees. The yellow-fleshed papaw is the edible one; the white-fleshed one retains the fetid odor until decay. The papaw is a dessert-fruit, having small value for culinary preparations.

THE ELDER

Several species of elder furnish edible berries in considerable quantities from wild plants, and are sometimes found under cultivation where other fruits fail, or to supplement the garden supply of other berries. The elder belongs to the genus Sambucus, a member of the honeysuckle or Caprifoliaceæ family; the only other genus which furnishes edible fruit is the Viburnum, one of whose species is the tree-cranberry. There are some twenty or more species of elders, rather widely distributed in the North Temperate Zone encircling the earth; three or four produce berries which are put to various culinary uses; the fruits of none are adapted for dessert purposes. While the plants of all elders are rather coarse, the species producing esculent berries are ornamental in leaf, blossom, and fruit, and are often made to serve esthetic as well as utilitarian purposes. The prominent botanical characters of the genus are:

Sambucus. Coarse shrubs or small trees with thick pithy branches and a rank smell when bruised. Leaves deciduous, opposite, odd-pinnate, serrate-pointed leaflets, with or without stipules. Flowers small, white, perfect, borne in broad compound cymes; calyx-lobes minute; corolla open-urn-shaped, with a spreading 5-cleft limb; stamens 5; ovary inferior; styles short, 3-lobed. Fruit a berry-like, black-purple juicy drupe containing 3-5 small seed-like nutlets; the edible berries borne in great profusion in early autumn. The three species which offer greatest horticultural possibilities and which are now occasionally cultivated are:

1. *Sambucus nigra,* Linn. European Elder. Shrub or small tree with deeply furrowed bark; branches gray, with numerous large lenticels. Leaflets dark green, at first pubescent but becoming smooth, usually 5, elliptic, acute, 2-6 inches long. Flowers in 5-divided cymes, 5 inches across. Berry black and lustrous, round, ¼-⅓ inch in diameter. There are many natural and horticultural varieties of the species, the habitat of which is temperate Europe and West Asia. It is grown in its various forms rather commonly as an ornamental.

2. *Sambucus canadensis,* Linn. American Elder. The American elder is often confused with the European elder, the two being easily distinguished, however. The native species is a shrub, seldom a tree; the wood is not so hard, often being semi-herbaceous; the wood is paler in color, with fewer and smaller lenticels; the plant is more stoloniferous. The leaflets are usually 7, instead of the usual 5 in the exotic, smaller and more pubescent on the veins beneath. The compound cymes are much broader across, often attaining a spread of 10-14 inches. The purple-black fruits are larger, sweeter, richer, better flavored, and more abundantly borne than those of the foreign elder. The European elder is, possibly, the better ornamental; the American species offers most to the pomologist. *Sambucus canadensis* ranges from Nova Scotia and Florida westward almost or quite to the Rocky Mountains. There are several most interesting natural and horticultural varieties.

3. *Sambucus cærulea,* Raf. Western Elder. This species is very similar to the eastern American elder,

differing chiefly in being a much larger plant; leaflets 5-7 which are more coarsely serrate, the lower ones often 3-parted. The flowers are in smaller cymes, 4-6 inches across, yellowish-white. The fruits are larger. the bluish-black color heightened by thick bloom, with a distinct flavor.

This species readily hybridizes with *S. canadensis* on the grounds of the New York Agricultural Experiment Station at Geneva, New York, but the resulting plants have not fruited. The western elder is an inhabitant of the far West from British Columbia to California, and eastward into the Rocky Mountains or almost to the territory of the eastern forms.

Elderberries are used for making wine, coloring wines or other fruits, and for pies and sauces. The flowers are fried in batter and eaten, and are also used for flavoring. The demand is not great, yet elderberries are rather commonly found on fruit-markets in Europe, and are not uncommon in American markets. The abundance of the wild crop, in parts of the world where the elder grows, obviates the necessity of cultivation; and the berries can be grown only for local markets, standing shipment but poorly. The elder has many qualities to recommend it for a cultivated plant; it thrives in a great diversity of soils and climates; the plants are comparatively free from fungi and insects; the plants are easily managed under cultivation; propagation is of the easiest, reproduction being effected readily by seeds or hard- or green-wood cuttings. Lastly, from the attempts to domesticate the elder, to be briefly discussed in the next paragraph, it would seem at least that the American elder is most plastic, and capable of rapid improvement.

That the elder is capable of improvement by selection and cultivation is shown by the behavior of several races brought under orchard management in widely different parts of the country. The selected plants differ from the wild ones in habit of growth, in size of leaf, in productiveness; the berries are larger and better flavored, and the bunches are larger. Horticultural literature contains records of at least four such improved elders. An improved elder was described in 1894 from Cedar Rapids, Iowa, called the Improved Elderberry; Frank Ford & Son, Bremen, Ohio, offered an improved elderberry in 1890; D. Brant, also of Bremen, Ohio, introduced an elder in 1891 under the name Brainerd; more recently, Wm. W. Adams, Union Springs, New York, has introduced an improved elder.

Four seedlings from Mr. Adams are growing on the grounds of the New York Agricultural Experiment Station. They are quite distinct, each deserving a varietal name, and all are truly remarkable elders. The berries on some clusters will average one-third of an inch in diameter. A peculiarity of the plants on the Station ground is that the plants are much larger than those of the wild elder and tend to take the tree or single-stem form. Should it prove desirable to do so, these elders could be grown as small trees.

THE HIGH-BUSH CRANBERRY

Several species of the large genus Viburnum furnish substitutes for cranberries. The best known of these is *V. Opulus*, variously called in Europe and America. The fruits are esteemed for sauces in both continents, although the species is better known as an ornamental, and is not often listed by nurserymen as a fruit-plant. No named varieties have been recorded in the past, but something is now being done towards its improvement by introducing variations from the wild and making further selections under cultivation. This work has now gone far enough to make it certain that the cranberry-tree is to become the parent of a race of domesticated plants.

Viburnum belongs to the honeysuckle or Caprifoliaceæ family, and is very similar in generic characters to Sambucus. It is sufficient to distinguish the two genera to say that the leaves of Sambucus are pinnate, the fruits berry-like, containing three small seed-like nutlets; while the leaves of Viburnum are simple, and the fruit is a one-celled, one-seeded drupe with a compressed stone.

322. High-bush cranberry. (×⅓)

Viburnum Opulus, Linn. Fig. 322. Tree Cranberry. High-bush Cranberry. Snowball. Guelder Rose. Whitten. Pimbina. Shrub attaining a height of 8-14 feet, smooth, erect, light gray. Leaves opposite, simple, palmately veined, broadly ovate, 3-lobed, wedge-shaped at the base, lobes pointed, coarsely dentate-serrate, pubescent beneath, 2-4 inches long; petioles bearing 2 glands at the apex. Flowers white, in cymes, 3-4 inches across, the marginal flowers neutral with enlarged flat corollas. Fruit a bright red drupe, globose, acid; stone flat, orbicular.

The typical form is a native of temperate Europe and west Asia, but var. *americanum*, (Mill.) Ait., placed by some botanists in a distinct species, *V. americanum*, Mill., is found in North America from New Brunswick to British Columbia and southward to New Jersey and Oregon. There are at least two other varieties; the best known is the sterile snowball, in which the whole cyme is turned into showy flowers; another variety has yellow fruits, and another variegated leaves.

The fruit of the European cranberry-tree is a poor substitute for the cranberry, being very sour and astringent, and having large, hard seeds, which make up the greater part of the

fruit. This is the form usually sold by nurserymen. The fruit of the American type is hardly better than that of the European as usually found, but the plant seems to be more variable; occasionally plants are found bearing fruits of pleasant acid taste, which are very agreeable substitutes for the cranberry. Taking advantage of this fact, A. E. Morgan, Dayton, Ohio, has spent some years in developing varieties suitable for garden culture.

Plants of six of Morgan's named varieties and many of his unnamed seedlings are now growing on the grounds of the New York Agricultural Experiment Station, Geneva, New York, in charge of the author. These are just coming into fruit, and their merits cannot as yet be passed upon with certainty, but the behavior of the various plants shows clearly that the groups are distinct and that in them we have a newly domesticated fruit of much value. The product is as palatable as that of the true cranberry, although hardly as pleasant eating, because of the seeds. The fruits are as attractive in appearance as those of the cranberry, will probably keep as long, and will certainly ship as well. The plants are hardier, as the originals came from the cold northern plains of Canada; they are probably freer from insects and fungi; whether more or less productive on equal areas of ground remains to be seen, but certainly they can be grown more cheaply, since the cost of establishing a plantation is far less; and, probably, they can be grown in many of the northern states, whereas the true cranberry grows in very restricted areas in a few states.

From what has already been done, it can be seen that the cranberry-tree responds quickly to the plant-breeder. Fruits and plants have many merits to recommend them, which is sufficient reason to continue their improvement; but perhaps a stronger reason is that a fruit of this type is needed to supplement the common cranberry. Another small-fruit for winter consumption as a fresh fruit could hardly fail to attract attention from consumers. Also, the late season of ripening; the difference in cultural operations; its probable occupation of land not suited to other small-fruits; and the possibility of its use as a handsome ornamental, all commend it as a desirable addition to the pomological flora of the country.

THE BUFFALO-BERRY

The buffalo-berry is cultivated somewhat in the colder parts of the Great Plains as a substitute for the currant. It is doubtful whether its merits are sufficient to give it a place in regions other than those where currants and gooseberries cannot withstand dry or cold climates. It is one of several fruits belonging to the oleaster or Elæagnaceæ family, the only other hardy fruit worth present notice being the goumi. The buffalo-berry belongs to the genus Shepherdia, which may be briefly characterized as follows:

Shepherdia. Shrubs or small tree with scurfy scales. Leaves opposite, entire, deciduous, petiolate, oblong, silvery-scurfy. Flowers diœcious, small, nearly sessile in their axils on the branches; sterile ones clustered, but the fertile flowers solitary or in 2's; sterile flowers with a 4-parted calyx and 8 stamens alternating with 8 processes of the thick disk; fertile flowers with an urn-shaped 4-cleft calyx, a slender style and a 1-sided stigma. Fruit drupe-like, the fleshy calyx enclosing a nut or achene. The two American species bear edible fruits, but only that of one is worthy cultivation, this now to be described.

Sheperdia argentea, Nutt. Fig. 323. Buffalo-Berry. Rabbit-Berry. Nebraska Currant. Shrub erect, very thorny, attaining a height of 18 feet, the young growth covered with white tomentum. Leaves oblong or oblong-wedge shaped, silvery on both sides. Flowers small, yellowish, in dense fascicles at the nodes. Fruit round or ovoid, the size of a large currant, red or yellow, acid but pleasantly flavored.

323. Buffalo-berry. (×½)

The buffalo-berry is one of the hardiest wild fruits, being found as far north as Manitoba and Saskatchewan and westward, thence southward to Colorado and Utah as far as the mountains of New Mexico. Indians and pioneers have long used the berries to enliven the scant fare of fruits. Their use as a sauce with buffalo-meat suggested the name. The species has been more or less cultivated, according to numerous accounts in horticultural literature, for nearly a century, but now finds favor only in localities where other fruits cannot be grown.

Once in hand, the fruits have much merit, but the crop is hard to obtain. Sprouts taken from wild thickets do not behave well in the garden, requiring a transitional period of a year or two in the nursery-row. Seeds must be stratified for winter-keeping and planted in nursery-rows to receive care for two or three years, before the plants are ready for the garden. Cuttings treated as those of the currant seem to grow readily. While not more difficult to grow than other bush-fruits, the crop is not easily harvested, because of the thorny plants and the small berries. Moreover, as the plants are diœcious, it is necessary to grow staminate and pistillate plants in proximity, but in what proportion has not yet been determined. In purchasing plants in small numbers, very often but one sex is obtained. Because of these difficulties, attempts to introduce the buffalo-berry as a garden plant have met with but indifferent success. They are not uncommon, however, as ornamental plants, and on the plains of the slopes

of the Rocky Mountains, wild plants supply an agreeable, refreshing fruit to thousands. The buffalo-berry is an excellent hedge plant.

The fruits vary greatly in season, size, quality, and may be either red or yellow, their plasticity in the wild indicating a possibility of improvements in the hands of man. In the wild, the bushes are loaded, making it appear that the crop would be prodigious, but the small size keeps the yield low; and, under cultivation, the plants are not so loaded. Very good sauces, jellies, and conserves are made from buffalo-berries, and, as the writer has found on the plains of Utah, after the fruit has been touched with frost, which alleviates the austerity, the berries are pleasant to eat out of hand. The crop may be harvested in late fall, or even in winter, if spared by birds. The berries retain their sprightly flavor when dried, the cured fruits being a favorite fruit of the western Indians.

Attempts to cultivate the buffalo-berry are by no means new. Oakes, Fuller, Green, Crozier, Card, Corbett, Hoskins, and Hansen, all men prominent in horticulture in America, have tried to popularize this fruit by word or deed without pronounced success. N. E. Hansen of the South Dakota Experiment Station, Brookings, South Dakota, at one time had as many as 7500 seedlings under observation, yet even with this attempt on a large scale, it cannot be said that the buffalo-berry has been placed among domesticated fruits.

THE GOUMI

Closely related to the buffalo-berry in the oleaster family is the goumi, belonging to the genus Elæagnus. Shepherdia has dicœcious flowers, eight stamens, and opposite leaves; whereas Elæagnus has perfect flowers, four stamens, and alternate leaves; these being the only noteworthy differences. There are some forty or more species of Elæagnus, of which but one, now to be described, is noteworthy for the fruits.

Elæagnus multiflora, Thunb. Fig. 324. Goumi. A low, bushy shrub with grayish or reddish-brown branchlets. Leaves elliptic, ovate or obovate-oblong, green above, silvery beneath, with stellate hairs above, becoming glabrous, and sprinkled with dark-brown scales beneath, 1-2½ inches long. Flowers small, fragrant, yellow within, silvery and scurfy on the outside; usually solitary in the axils. Fruit oblong or oval, blunt or flattened at the ends, ½-¾ inch long, orange colored or reddish, with silvery white dots; pedicels much longer than the fruits; at first very astringent but becoming agreeably acid with maturity.

The goumi grows wild in China and Japan, where the fruits are in use for various culinary preparations. It is a comparatively new fruit in America. Ellwanger & Barry, Rochester, New York, introduced it about 1889, since which time it has been offered by nurserymen chiefly as an ornamental.

The plant is hardy in eastern United States, and not more difficult to propagate and manage in the garden than other bush-fruits. Propagation is by cuttings or seed. The fruits ripen in midsummer, are most attractive in appearance, and are borne in great profusion. While too acid for dessert, the product is adapted to all culinary preparations for which the cranberry is used. There are no garden varieties offered as yet, but no doubt selection could be made where the culture of the plant is desirable. Should the goumi prove adapted to the dry or cold regions of the Great Plains, it might make a more desirable fruit than the smaller-fruited buffalo-berry. Wherever it thrives, it is well worth growing as an ornamental.

324. Goumi. (×½)

THE BARBERRY

Berberis, a genus of about 175 species in the temperate zones of five continents, is rich in potentialities for pomology, as many wild barberries furnish edible fruits, while some half dozen species are more or less cultivated in different parts of the world. The genus belongs to the barberry or Berberidaceæ family, of which it is the type; there are no other noteworthy genera, although the closely related Mahonia furnishes two or three ornamental species, the fruits of which are edible; and the quite distinct Podophyllum is the mandrake or may-apple of eastern woods. The genus has several very distinctive characters, which make its species easily recognizable.

Berberis. Spiny shrubs with yellow wood and inner bark. Leaves alternate, deciduous or evergreen, simple. Flowers borne in racemes, fascicles or solitary, usually yellow; sepals 6, roundish, with 2-6 bractlets outside; petals 6, obovate, concave, usually smaller than the sepals, with 2 glandular spots above the claw; stamens 6, irritable; stigma circular, depressed; ovary superior. Fruit a berry, with 1-several oblong seeds.

Of the many barberries, at least the following are recorded as furnishing fruit to be found in the markets of the world from wild or cultivated plants: *B. angulosa,* Wall., is a rare Himalayan species with large fruits; the Pepal barberry, *B. aristata,* DC., produces purple fruits which in India are dried in the sun as raisins and used as dessert; the fruit of the Asiatic barberry, *B. asiatica,* Roxb., is said to make the finest of raisins in India, and is

sometimes found on English tables from English gardens; the Magellan barberry, *B. buxifolia,* Lam., is an evergreen shrub from the Straits of Magellan, yielding large, black, well-flavored fruits in South America and England; at one time it was sold by nurserymen in the United States under the name Black Sweet Magellan; Darwin's barberry, *B. Darwinii,* Hook., from Chile, is grown as an ornamental in England, where the berries are said to be eagerly eaten by children; most grown of all, however, is *B. vulgaris,* Linn., the common barberry, which must be described and discussed at greater length.

Berberis vulgaris, Linn. Fig. 325. Common Barberry. A spiny, upright shrub attaining a height of 12-14 feet, with gray, grooved, arching branches. Leaves obovate or spatulate, bristle-toothed, 1-2 inches long, grayish-green beneath. Flowers many, in drooping racemes. Fruit oblong-ovoid, scarlet or becoming purple, acid but agreeably flavored and suitable for culinary preparations. The species is exceedingly variable, and there are many botanical and horticultural varieties, most interesting of which to pomologists are seedless sorts, one with yellow fruits and another with black or purplish-blue fruits.

325. Common barberry. (×½)

The common barberry is a native of temperate Europe and Asia, but, early introduced in America, it is now thoroughly wild in many and scattered localities in North America. The plant is now considered a dangerous pest as a host of one stage of wheat-rust, and the laws of several states compel its destruction whether found as a wild or a cultivated plant.

The barberry has been cultivated as an ornamental and hedge plant for centuries, possibly since Christ's time, as Pliny in the first century describes a plant thought to be this. Yet it has ever been but a supplementary fruit, never attaining great popularity; never giving origin to varieties grown exclusively for fruit; and long under suspicion as a dangerous harborer of wheat-rust. It is certain, also, that the barberry is declining in favor; it has been much more popular in England or America at any past time in the last three centuries than it is now. It is, however, a species well worthy attention for its fruits. No doubt strains of it or hybrids with other species could be selected immune to wheat-rust and with larger and less acid fruits; if so, the hardiness, vigor, and productiveness of the plants, and the handsome, refreshing fruits commend it to add variety to any fruit-garden. An enumeration of the uses to which the fruits of various species of barberries are put in different countries may further its claims to attention on the part of fruit-growers.

Barberries are most commonly used for sauces, tarts, and pies, but are often preserved in sugar or sirup as comfits; a celebrated preserve is made in Rouen, France, from a seedless variety. In India the fruit is so commonly cured as a raisin that barberry raisins are an article of commerce and export. In northern Europe, barberries are a substitute for lemon-juice for making cooling drinks and flavoring ices, sherberts, and punches. Pickled in vinegar while green, the berries are an excellent substitute for capers. Besides these uses, the old herbalists mention them as most useful in garnishing, the bunches being used either fresh or preserved. The leaves have much of the acid of the berry, and were formerly, and still might be, used for salads and for seasoning. The old writers had much to say of the remarkable medicinal value of barberries in several ills of mankind, but of these virtues none would pass with modern physicians; unless, perhaps, the claim in many countries that the berries are a sovereign remedy for inflamed throats and tonsils should be admitted.

The barberry is worth improving. A collection should be made of the species having most merits for their fruits. Presumably, many hybrids could be made, as a number of ornamental forms originated from hybrids. From species and hybrids, there is little question that valuable fruits might in time be selected to serve new purposes, to supplement the present fruit-supply, and to serve in regions where less hardy and vigorous fruits do not thrive. Few genera remain to be domesticated which have greater potentialities than Berberis.

The genus Mahonia, usually included in Berberis, from which it is distinguished by its unarmed branches, pinnate leaves, and more numerous sepals, offers some possibilities as fruit-producing plants. The fruits of *M. Aquifolium,* Nutt., the Oregon grape; *M. nervosa,* Nutt., also called the Oregon grape; *M. pinnata,* Fedde, the blue barberry of the Pacific coast; *M. Fremontii,* Fedde and *M. trifoliata,* Fedde, from southwestern United States are native mahonias with some food value, and all furnish berries from which refreshing drinks and flavoring juices, and wines as well, are made from the product of wild plants.

NOMENCLATURE

The nomenclature in the *Cyclopedia of Hardy Fruits* follows in the main the Code of Fruit Nomenclature of the American Pomological Society as revised by a Committee of the Society appointed by the President at the 1921 session in Toledo, Ohio, the Committee having been given power to act for the Society. It was found impossible, however, to reduce all names to this Code, although there are but few exceptions. Prevailing usage has most often dictated the departures from the Code.

CODE OF FRUIT NOMENCLATURE AMERICAN POMOLOGICAL SOCIETY

This code aims to establish a simple and clear system of pomological nomenclature that shall be appropriate and stable. Accordingly it is urged that all persons naming new varieties of fruits choose simple one-word names that are fittingly expressive of some character, quality, place, person, or event associated with the source, time or place of origin of the variety.

The paramount right of the originator, discoverer, or introducer of a new variety to name it, within the limitations of this code, is recognized and established.

The term "kind" as herein used shall be understood to apply to those general classes of fruits which are grouped together in common usage without regard to their exact botanical relationship, as apple, cherry, grape, peach, plum, raspberry, etc.

I. FORM OF NAMES

1. Names of new varieties shall be of one word preferably, but two words may be accepted. Names of existing varieties shall not be changed in such way as to lead to confusion or loss of identity.

2. The spelling and pronunciation of a variety name shall be the same as that of the person, place, substance, circumstance, or quality from which it is derived.

3. A possessive noun shall not be used.

4. Initials should not be used as a part of a variety name.

5. A name shall not be formed by the compounding or hyphenating of two or more existing names, but this does not prohibit the formation of a one-word name by the use of parts of two or more existing names. The hyphen shall not be used between the words of a name. Thus, neither Bartlett-Seckel nor Bar Seck may be used, but Barseck is admissible.

6. Such general terms as seedling, hybrid, beurre, damson, pippin, rare-ripe, bigarreau, should not be used.

7. A variety imported from a foreign country should retain its foreign name, subject only to such modification as is necessary to conform it to this code, and provided that names having a recognized English equivalent may be, but are not necessarily so rendered.

8. The name of a person shall not be applied to a variety in his life time without his consent.

9. The name of a deceased person shall not be applied to a variety except through formal action by some competent pomological body, preferably that with which the deceased was most closely associated.

II. PRIORITY, USAGE AND DUPLICATION

10. The name first published for a variety shall be the accepted and recognized name except when contrary to the provisions of this code; but names established by usage in American pomological literature may be retained even though they do not conform to these rules.

11. A name once used shall not be used again for a variety of the same kind, except that a name once established through long usage for two or more American varieties shall not be displaced for either or radically modified only when a well-known synonym can be used in its place; or when no such synonym is available, the varieties bearing identical names may be distinguished by the addition of the name of the author who first described each, or by some other suitable distinguishing term.

III. PUBLICATION AND DESCRIPTION

12. Publication consists in: (1) The public distribution of a printed name and description or characterization of the fruit (2) the publication of a new name for a variety described elsewhere under a different name, number, or other untenable designation the synonym being given.

13. Publication of a name may be made in any book, bulletin, report, trade catalog or periodical of public distribution and bearing date of issue.

14. But a varietal name may be established by current usages in the locality of its origin, when well known, and shall be considered as published and have precedence over a later printed name for the same variety.

15. Complete description of a variety consists of a detailed account of the characteristics of the plant, foliage, flowers, fruit, and habit of growth, so as to distinguish it from other varieties of similar appearance.

16. The type of a variety is the fruit of the original plant; and type descriptions or illustrations shall be made from material produced by the original plant, or when this is not available, from a plant as near as possible to the original in asexual reproduction, and preferably grown in the same pomological region.

GLOSSARY

ABAXILE. Said of the core of a pome when the walls of the carpel are distant from the axis.
ABORTION. Imperfect development or non-development of an organ.
ABRUPT. Suddenly narrowed.
ACAULESCENT. Stemless or apparently so.
ACHENE. A hard, dry, one-seeded, indehiscent fruit, especially one in which the pericarp very closely envelops the seed.
ACUMINATE. Tapering at the end.
ACUTE. Terminating with a sharp angle.
ADAPTATION. The fitness or fitting of any organ or organism to perform certain functions or to live in certain conditions.
ADVENTITIOUS. Said of buds, or of shoots, which appear in abnormal or unaccustomed places or numbers, rather than at nodes and in definite number.
ADVENTIVE. Imperfectly naturalized.
ÆSTIVATION. The arrangement of the parts of the perianth in the bud.
ALTERNATE (of leaves, etc.). Not opposite on the axis, but arranged singly at different heights.
ANNUAL. Of only one year's duration.
ANNULAR. In the form of a ring.
ANTHER. The pollen-bearing part of a stamen.
APETALOUS. Having no petals.
APEX. The end of a fruit most distant from the stem.
APICAL. Pertaining to the apex or top.
APICULATE. Ending in a short, pointed tip.
APPRESSED. Lying close and flat against.
AREOLE. A small space marked out upon a surface.
ARTICULATE. Having a node or joint.
ASCENDING. Rising somewhat obliquely, or curving upward.
ATTENUATE. Slenderly tapering; becoming very narrow.
AXIL. Angle above the junction of a leaf-blade, petiole, peduncle, or pedicel, with the branch or stalk from which it springs.
AXIS. The central line of any organ or support of a group of organs.

BACCATE. Berry-like; pulpy throughout.
BASE. The point of attachment of a fruit.
BASIN. In pomological writings, the depression in the apex of a pome.
BEAKED. Ending in a prolonged tip.
BEARDED. Bearing a long awn, or furnished with long or stiff hairs.
BERRY. A fruit, the whole pericarp of which is fleshy or pulpy.
BIENNIAL. Of two years' duration.
BIFID. Two-cleft.
BIGENER, BIGENERIC-HYBRID. A hybrid between species of different genera.
BIGENERIC HALF-BREED. The product of a cross between varieties of species of different genera.
BISEXUAL. Having both stamens and pistils.
BLADE. The expanded portion of a leaf, etc.
BLOOM. The delicate, white substance on the surface of some fruits; or on the canes or vine and bramble-fruits.
BLUSH. An unbroken red tint on the surface of a fruit.
BRACT. A modified leaf subtending a flower or belonging to an inflorescence.
BRACTEATE. Having bracts.
BRACTEOSE. With numerous or conspicuous bracts.
BRACTLET. A secondary bract, as one upon the pedicel of a flower
BRUSH. The bundle of fibres connecting the pedicel with the berry of the grape.
BUD. The rudimentary state of a stem or branch; an unexpanded flower.
BULLATE. Blistered or puckered.

CADUCOUS. Falling off early.
CALLOSITY. A hardened thickening.
CALLUS. A hard protuberance or callosity.
CALYX. The outer series of the perianth of the flower; the sepals.
CAMPANULATE. Bell-shaped; cup-shaped with a broad base.
CANE. A shoot which bears but once, particularly one which arises from the crown or root.
CANESCENT. Hoary with gray pubescence.
CAPILLARY. Hair-like.
CARPEL. One of the separable or integral parts of a compound pistil.
CAULINE. Belonging to the stem.
CAVITY. The depression in the stem-end of a pome.
CELL. One of the minute vesicles of which plants are formed. Any structure containing a cavity, as the cells of an anther, ovary, etc.
CELLULAR. Composed of short, transparent, thin-walled cells.
CHALAZA. The place where seed-coat and kernel of a seed connect.
CHLOROPHYLL. The green coloring-matter within the cells of plants.
CILIATE. Marginally fringed with hairs.
CINEREOUS. Ash-color.
CION. A cutting set into a plant rather than in soil; graft.
CLOSE-FERTILIZATION. Self-fertilization.
COALESCENCE. The union of parts or organs of the same kind.
COMPOUND. Composed of two or more similar parts united into one whole.
COMPOUND LEAF. One divided into separate leaflets.
COMPRESSED. Flattened, especially laterally.
CONDUPLICATE. Folded together lengthwise.
CONFLUENT. Running into each other.
CONNIVENT. Coming into contact.
CONVOLUTE. Rolled up longitudinally.
CORDATE. Heart-shaped, with the point upward.
CORE. The ovary of a pome-fruit; the central part of a fruit.
CORIACEOUS. Leathery in texture.
COROLLA. The inner perianth, of distinct or connate petals.
CORONIFORM. Shaped like a crown.
CORRUGATE. Wrinkled or in folds.
CORYMB. A flat-topped or convex open flower-cluster.
CORYMBOSE. In corymbs or corymb-like.
COTYLEDONS. The foliar portion or first leaves (one, two, or more) of the embryo as found in the seed.
CRENATE. Dentate, with the teeth much rounded.
CRENULATE. Finely crenate.
CRISTATE. Bearing an elevated appendage resembling a crest.
CROSS. The offspring of any two flowers which have been cross-fertilized.
CROSS-BREED. A cross between varieties of the same species.
CROSSING. The operation or practice of cross-pollinating.
CROSS-POLLINATION. Transfer of pollen to pistil of another flower.
CROWN. An outgrowth from the throat of the perianth; corona; also the top of a bulb or corm, or of an upright rootstock; also that portion of a plant at the surface of the ground.
CUNEATE. Wedge-shaped; triangular, with the acute angle downward.
CYME. A usually broad and flattish determinate inflorescence, i.e., with its central or terminal flowers blooming earliest.
CYMOSE. Bearing cymes, or cyme-like.

DECIDUOUS. Not persistent; not evergreen.
DECOMPOUND. More than once compound or divided.

GLOSSARY

DECUMBENT (leaf). Extending down the stem below the insertion.
DEFINITE. Of a constant number, not exceeding twenty.
DEFLEXED. Bent or turned abruptly downward.
DEHISCENCE. The mode of opening; applied especially to fruits and anthers.
DEHISCENT. Opening regularly by valves, slits, etc., as a capsule or anther.
DENTATE. Toothed, usually with the teeth directed outward.
DENTICULATE. Minutely dentate.
DEPRESSED. Somewhat flattened from above.
DIAPHRAGM. The woody tissue which interrupts the pith at the node in a grape-vine.
DICHOTOMOUS. Forking regularly by pairs.
DIFFUSE. Widely or loosely spreading.
DIGITATE. Compound, with the members arising together at the apex of the support.
DIŒCIOUS. Unisexual, with two kinds of flowers on separate plants.
DISSECTED. Cut or divided into numerous segments.
DISTINCT. Separate; not united; evident.
DIVARICATE. Widely divergent.
DIVIDED. Lobed to the base.
DOMESTICATION. The state or condition of being adapted or inured to cultivation, or the act of adapting or inuring to cultivation.
DORSAL. The back or outer surface of an organ.
DRUPACEOUS. Resembling a drupe.
DRUPE. A fleshy or pulpy fruit with the inner portion of the pericarp (1-celled and 1-seeded, or sometimes several-celled) hard or stony.
DRUPELET. A diminutive drupe.

ECHINATE. Beset with prickles.
EFFUSE. Very loosely spreading.
ELLIPTICAL. Applied to oblong leaves which gradually taper both ways from the middle.
EMARGINATE. Having a shallow notch.
EMASCULATION. Removal of stamens or anthers.
EMBRYO. The rudimentary plantlet within the seed.
ENDOCARP. The inner layer of a pericarp.
ENTIRE. Without toothing or division.
ENVIRONMENT. The sum of the physical conditions in which an organism lives.
EPHEMERAL. Lasting for only one day.
EPICARP. The outer layer of the pericarp or matured ovary.
EPIDERMIS. The superficial layer of cells.
EXFOLIATING. Cleaving off in thin layers.
EXOCARP. Outer layer of a pericarp.
EXSERTED. Projecting beyond an envelope, as stamens from a corolla.
EXTRORSE. Facing downward.
EYE. The calyx of a pome-fruit; a compound bud of a grape.

FAMILY. A natural assemblage of plants thrown together because of resemblances.
FARINACEOUS. Containing starch; starch-like.
FARINOSE. Covered with a meal-like powder.
FASCICLE. A close bundle or cluster.
FASCICULATE. In close bundles or clusters.
FASTIGIATE (branches). Erect and near together.
FEMALE. Fertile; pistillate.
FERRUGINOUS. Rust-color.
FERTILE. Capable of producing fruit; or productive, as a flower having a pistil, or an anther with pollen.
FERTILIZATION. Action of the pollen upon the egg-cell of the embryo-sac, resulting in the formation of the embryo; impregnation; fecundation.
FIBROUS. Composed of or resembling fibers.
FIBROUS TISSUE. A tissue formed of elongated thick-walled cells.
FILAMENT. The part of a stamen which supports the anther; any thread-like body.
FILAMENTOUS. Composed of threads.
FILIFORM. Thread-shaped.
FIMBRIATE. Fringed.
FIMBRILLATE. Having a minute fringe.
FLACCID. Without rigidity.
FLEXUOUS. Zigzag; bending alternately in opposite directions.
FLORA. The plants of a region; also a book treating of the plants of a region.
FLORET. A small flower, usually one of a dense cluster.
FLORIFEROUS. Flower-bearing.
FOLIACEOUS. Leaf-like in texture or appearance.
FOLLICLE. A fruit consisting of a single carpel, dehiscing by the ventral suture.
FOLLICULAR. Like a follicle.
FORKED. Divided into nearly equal branches.
FOXINESS. The peculiar smell and taste in some grapes.
FREE. Not adnate to other organs.
FRUCTIFICATION. The act or organs of fruiting.
FRUIT. The seed-bearing product of a plant.
FUGACIOUS. Falling or fading very early.
FUNICLE. The free stalk of an ovule or seed.
FUSIFORM. Spindle-shaped; swollen in the middle and narrowing toward each end.

GENUS. A group comprising a greater or less number of closely related species.
GIBBOUS. Protuberant or swollen on one side.
GLABRATE. Somewhat glabrous, or becoming glabrous.
GLABROUS. Smooth; not rough, pubescent or hairy.
GLAND. A secreting surface or structure.
GLANDULAR. Bearing glands or of the nature of a gland.
GLAUCOUS. Covered with a bloom.
GRAFT. A cutting set into a plant; cion.
GRANULOSE. Composed of or appearing as if covered by minute grains.

HABIT. The general appearance of a plant.
HABITAT. The place in which an organism lives.
HEART-SHAPED. Ovate with two rounded lobes and a sinus at the base.
HERB. A plant with no persistent woody stem above ground.
HERBACEOUS. Having the character of an herb.
HERMAPHRODITE. Bisexual.
HILUM. The scar or point of attachment of the seed.
HIRSUTE. Pubescent with rather coarse or stiff hairs.
HIRSUTULOUS. Slightly hirsute.
HIRTELLOUS. Minutely hirsute.
HISPID. Beset with rigid or bristly hairs or with bristles.
HOARY. Grayish-white with a fine close pubescence.
HYALINE. Transparent or translucent.
HYBRID. A cross-breed of two species.
HYBRIDIZATION. The state or condition of being hybridized, or the process or act of hybridizing.
HYBRIDIZING. The operation or practice of crossing between species.
HYPOGYNOUS. Situated on the receptacle beneath the ovary and free from it and from the calyx; having the petals and stamens so situated.

IMBRICATE. Overlapping.
IMPERFECT. Lacking either gynœcium or andrœcium.
IMPRESSED. Bent inward as if by pressure.
INCISED. Cut sharply and irregularly and more or less deeply.
INCLUDED. Not at all protruded from the surrounding envelope.
INCOMPLETE FLOWER. One from which any of the four series is missing.
INDEFINITE. Inconstant in number or very numerous.
INDEHISCENT. Not opening by halves.
INDIGENOUS. Original to the region.
INDURATED. Hardened.
INFERIOR. Lower or below; outer or anterior.
INFLATED. Bladdery.
INFLORESCENCE. The flowering part of a plant, and especially the mode of its arrangement.
INSERTED. Attached to or growing out of.
INSERTION. Method of attachment.
INTERNODE. The portion of a stem between two nodes.
INTRAMARGINAL. Within and near the margin.
INTRODUCED. Brought intentionally from another region for purposes of cultivation.
INTRORSE. Turned inward or toward the axis.
INVOLUCRE. A circle or collection of bracts surrounding a flower-cluster or head.
INVOLUTE. Rolled inward.
IRREGULAR. Showing inequality in the size, form or union of its similar parts.

LACERATE. Irregularly cleft as if torn.
LACINIATE. Slashed; cut into narrow pointed lobes.
LANCEOLATE. Shaped like a lance-head, several times longer than wide, broadest above the base and narrowed to the apex.
LATENT. Said of a bud which remains dormant.
LEAFLET. A single division of a compound leaf.
LENTICULAR. Of the shape of a double-convex lens.

LINEAR. Long and narrow, with parallel margins.
LOBE. Any segment of an organ, especially if rounded.
LOBED. Divided into or bearing lobes.

MALE. Sterile; staminate.
MAMMIFORM. Said of fleshy nipple-like protuberances.
MEDIAN. Said of stamens in the middle of the calyx-tube.
MIDRIB. The central or main rib of a leaf.
MONŒCIOUS. With stamens and pistils in separate flowers on the same plant.
MUCRO. A short and small abrupt tip.
MUCRONATE. Tipped with a mucro.

NECTARIFEROUS. Producing nectar.
NECTARY. Any place or organ where nectar is secreted.
NERVE. An unbranched vein or slender rib.
NODE. The place upon a stem which normally bears a leaf or whorl of leaves.
NODOSE. Knotty or knobby.
NODULOSE. Provided with little knots or knobs.
NUT. A hard indehiscent 1-celled and 1-seeded fruit, though usually resulting from a compound ovary.
NUTLET. A diminutive nut.

OBCOMPRESSED. Compressed dorso-ventrally instead of laterally.
OBCONICALLY. Inversely conical, having the attachment at the apex.
OBCORDATE. Inverted heart-shaped.
OBLANCEOLATE. Lanceolate with the broadest part toward the apex.
OBLIQUE. Unequal sided or slanting.
OBLONG. Longer than broad and with nearly parallel sides.
OBOVATE. Inverted ovate.
OBOVOID. Having the form of an inverted egg.
OBSOLETE. Not evident; rudimentary.
OBTUSE. Blunt or rounded at the end.
OPAQUE. Dull; neither shining nor translucent.
ORBICULAR. Circular.
ORGAN. A part of a living body directly associated with the vital functioning.
OVAL. Broadly elliptical.
OVARY. The part of the pistil that contains the ovules.
OVATE. Egg-shaped; having an outline like that of an egg, with the broader end downward.
OVOID. A solid with an oval outline.
OVULE. The body which after fertilization becomes the seed.

PALMATE (leaf). Radiately lobed or divided.
PALMATELY. In a palmate manner.
PANICLE. A loose irregularly compound inflorescence with pedicellate flowers.
PANICLED, PANICULATE. Borne in a panicle; resembling a panicle.
PAPILLOSE. Bearing minute nipple-shaped projections.
PARTED. Cleft nearly but not quite to the base.
PEDICEL. The support of a single flower.
PEDICELLATE. Borne on a pedicel.
PEDUNCLE. A primary flower-stalk, supporting either a cluster or a solitary flower.
PEDUNCULATE. Borne upon a peduncle.
PELLUCID. Clear, transparent.
PELTATE. Shield-shaped and attached to the support by the lower surface.
PENDULOUS. More or less hanging.
PERENNIAL. Lasting year after year.
PERFECT (flower). Having both pistil and stamens.
PERFOLIATE (leaf). Having the stem apparently passing through it.
PERIANTH. The floral envelope, consisting of the calyx and corolla (when present), whatever their form.
PERICARP. The matured ovary.
PERIGYNOUS. Adnate to the perianth, and therefore around the ovary and not at its base.
PERIPHERAL. On or near the margin.
PERSISTENT. Long-continuous, as a calyx upon the fruit, leaves through winter, etc.
PETAL. A division of the corolla.
PETALOID. Colored and resembling a petal.
PETIOLATE. Having a petiole.
PETIOLE. The footstalk of a leaf.
PIGMENT. The coloring matter in the skin of a fruit.
PILOSE. Hairy, especially with soft hairs.
PINNATE (leaf). Compound, with the leaflets arranged on each side of a common petiole.
PINNATIFID. Pinnately cleft.
PINNULE. A secondary pinna; one of the pinnately disposed divisions of a pinna.
PISTIL. The seed-bearing organ of the flower, consisting of the ovary, stigma, and style when present.
PISTILLATE. Provided with pistils, and, in its more proper sense, without stamens.
PITTED. Marked with small depressions or pits.
PLICATE. Folded into plaits, usually lengthwise.
PLUMULE. The bud or growing point of the embryo.
POLLEN. The fecundating grains contained in the anther.
POLLINATION. The act or fact of conveying pollen from anther to stigma.
POLLINIFEROUS. Bearing pollen.
POLYGAMOUS. Hermaphrodite and unisexual flowers variously mixed upon the plant.
POLYPETALOUS. Having separate petals.
POME. A fleshy fruit of which the apple is a type.
POSTERIOR. In an axillary flower, on the side nearest to the axis of inflorescence.
PRICKLE. A small spine from the bark or rind.
PROCUMBENT. Lying on the ground or trailing but without rooting at the nodes.
PROSTRATE. Lying flat upon the ground.
PUBERULENT. Minutely pubescent.
PUBESCENT. Covered with hairs, especially if short, soft and down-like.
PULVERULENT. Powdered; appearing as if covered by minute grains of dust.
PUNCTATE. Dotted with depressions or with translucent internal glands or colored dots.
PUNCTICULATE. Minutely punctuate.
PYRIFORM. Pear-shaped.

QUALITY. The combination of characters in a fruit which makes it pleasant to the palate.

RACEME. A simple inflorescence of pediceled flowers upon a more or less elongated axis.
RACEMOSE. In racemes; or resembling a raceme.
RADIATE. Spreading from or arranged around a common center.
RADICAL. Belonging to or proceeding from the root or base of the stem near the ground.
RAMIFICATION. Branching.
RAPHE. The ridge which runs from the hilum to the chalaza in a seed.
RECEPTACLE. The more or less expanded or produced portion of an axis which bears the organs of a flower or the collected flowers of a head.
RECURVED. Curved downward or backward.
REFLEXED. Abruptly bent or turned downward.
REGULAR. Uniform in shape or structure.
RENIFORM. Kidney-shaped.
REPENT. Creeping; prostrate and rooting at the nodes.
RESINIFEROUS. Producing resin.
RETICULATE. In the form of network; net-veined.
RETRORSE. Directed back or downward.
RETUSE. With a shallow notch at a rounded apex.
REVOLUTE. Rolled backward from the margins or apex.
RIB. A primary or prominent vein of a leaf; a ridge on a pome-fruit.
ROOT. The underground part of a plant which supplies it with nourishment.
ROSETTE. A much-shortened stem bearing a dense cluster of leaves.
ROSTRATE. Having a beak.
ROTATE. Wheel-shaped; flat and circular in outline.
RUCINATE. Sharply incised, with the segments directed backward.
RUFOUS. Reddish-brown.
RUGOSE. Wrinkled.
RUNNER. A filiform or very slender stolon.

SACCATE. Sac-shaped.
SALVER-SHAPED. Having a slender tube abruptly expanded into a flat limb.
SCABROUS. Rough to the touch.
SCAPE. A peduncle which arises from the ground, is simple, or nearly so, not jointed, and destitute of foliage.
SCARF-SKIN. The roughened outer skin of a pome-fruit.
SCARIOUS. Thin, dry, and membranaceous, not green.
SEED. The ripened ovule, consisting of the embryo and its coats.
SEEDLING. A plant growing directly from seed, without the intervention of grafts, layers or cuttings.

GLOSSARY

SEGMENT. One of the parts of a leaf or other like organ that is cleft or divided.
SELF-COLORED. Of one color; not striped.
SELF-FERTILIZATION. Action of pollen upon a pistil of the same flower; close-fertilization.
SEPAL. A division of a calyx.
SERRATE. Having sharp teeth pointing forward.
SERRULATE. Finely serrate.
SESSILE. Without footstalk of any kind.
SETA. A bristle.
SETACEOUS. Bristle-like.
SETIFORM. Bristle-shaped.
SETOSE. Beset with bristles.
SETULOSE. Having minute bristles.
SHRUB. A woody perennial, smaller than a tree, usually with several stems.
SILKY. Covered with close-pressed soft pubescence.
SIMPLE. Of one piece; not compound.
SINUATE. With the outline of the margin strongly wavy.
SINUS. The cleft or recess between two lobes.
SMOOTH. Without roughness or pubescence.
SPATULATE. Gradually narrowed downward from a rounded summit.
SPECIES. The unit in classification.
SPINE. A sharp woody or rigid outgrowth from the stem.
SPINOSE. Spine-like.
SPINULE. A little spine or spine-like process.
SPUR. A hollow sac-like or tubular extension.
STAMEN. One of the pollen-bearing organs of the flower.
STELLATE, STELLIFORM. Star-shaped; said of star-like dots on the apple.
STEM. The main ascending axis of a plant.
STERILE. Unproductive, as a flower without pistil, or stamen without an anther.
STIGMA. That part of a pistil through which fertilization by the pollen is effected.
STIGMATIC. Belonging to or characteristic of the stigma.
STIPULE. An appendage at the base of a petiole or on each side of its insertion.
STOLON. A runner, or any basal branch that is disposed to root.
STOLONIFEROUS. Producing stolons.
STRIATE. Marked with fine longitudinal lines or ridges.
STRIGOSE. Beset with appressed sharp straight and stiff hairs.
STYLE. The usually attenuated portion of the pistil connecting the stigma and ovary.
SUCCULENT. Juicy; fleshy.
SUCKER. A sprout or shoot arising from an underground root or stem; also, an adventitious shoot in the top of a plant, especially a vigorous shoot.
SUFFRUTESCENT. Slightly or obscurely shrubby.
SUFFRUTICOSE. Very low and woody; diminutively shrubby.
SULCATE. Grooved or furrowed.
SUPERIOR. Said of the ovary when it is free; above, in position.
SUTURE. A line of dehiscence.
SYMMETRICAL. (flower). Regular as to number of its parts: having the same number of parts in each circle

TENDRIL. The coiled, thread-like organ by which a vine clasps an object.
TERETE. Having a circular transverse section.
TERNATE. In threes.
TESTA. The outer, commonly hard and brittle seed-coat.
THROAT. The orifice of a gamopetalous corolla or calyx; the part between the proper tube and the limb.
TOMENTOSE. Densely pubescent with matted wool.
TORUS. The receptacle of a flower.
TRIFID. Three-cleft.
TRIFOLIATE. Having three leaflets.
TRUNCATE. Ending abruptly, as if cut off transversely.
TUMID. Swollen.
TURBINATE. Top-shaped; inversely conical.

UMBEL. An inflorescence in which the peduncles or pedicels of a cluster spring from the same point.
UMBELLATE. In or like an umbel.
UNDULATE. With a wavy surface.
UNISEXUAL. Of one sex, either staminate or pistillate only.

VALVATE. Opening by valves, as a capsule; in æstivation, meeting by the edges without overlapping.
VARIETY. A form, which, in the judgment of any writer, is considered to be subordinate to the species in classificatory importance.
VEINS. Threads of fibrovascular tissue in a leaf or other organ, especially those with branch.
VENATION. Veining.
VENTRAL. Belonging to the inner face of an organ; the opposite of dorsal.
VENTRICOSE. Swelling unequally, or inflated on one side.

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